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HENRY B. PARSONS.

PROCEEDINGS

OF THE

American Pharmaceutical Association

AT THE

THIRTY-THIRD ANNUAL MEETING,

HELD AT PITTSBURGH, PA., SEPTEMBER, 1885.

ALSO THE

CONSTITUTION, BY-LAWS, AND ROLL OF MEMBERS.

PHILADELPHIA:
PUBLISHED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION.
1886.

OFFICERS OF THE ASSOCIATION.

1884-85.

PRESIDENT.

JOSEPH ROBERTS. . . . . Baltimore, Md.

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ALBERT H. HOLLISTER . . . . Madison, Wis.

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THIRD VICE-PRESIDENT.

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LOCAL SECRETARY.

WILLIAM B. BLANDING . . . . Providence, R. I.

REPORTER ON PROGRESS OF PHARMACY.

C. LEWIS DIEHL . . . . Louisville, Ky.

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COMMITTEE ON DRUG MARKET.

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Oscar Oldberg	Chicago.

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John M. Maisch (Chairman)	Philadelphia.
Samuel A. D. Sheppard	Boston.
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W. P. DeForest	Brooklyn, N. Y.
S. J. Bendiner	New York, N. Y.
A. Tsheppe	New York, N. Y.

COMMITTEE ON ARRANGEMENTS.*

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S. A. D. Sheppard	Boston, Mass.
P. W. Bedford	New York, N. Y.
Wm. H. Cotton	Newport, R. I.
Edmund C. Danforth	Providence, R. I.

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Charles A. Heinitsh (Chairman)	Lancaster, Pa.
Charles Caspari, Jr.	Baltimore, Md.
James T. Shinn	Philadelphia, Pa.
Charles Bullock	Philadelphia, Pa.
Joseph L. Lemberger	Lebanon, Pa.

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* Appointed by the Chairman. See page 480

COUNCIL.

MEMBERS OF THE COUNCIL.

Term expires.		
1886.	THE OFFICERS OF THE ASSOCIATION, *ex officio:*	
"	JOSEPH P. REMINGTON	Philadelphia, Pa.
"	GEORGE W. KENNEDY	Pottsville, Pa.
"	HENRY J. MENNINGER	Brooklyn, N. Y.
1887.	WILLIAM J. M. GORDON	Cincinnati, O.
"	JOSEPH L. LEMBERGER	Brooklyn, N. Y.
"	WILLIAM S. THOMPSON	Washington, D.C.
1888.	SAMUEL A. D. SHEPPARD	Boston, Mass.
"	WILLIAM SAUNDERS	London, Ont.
"	ALBERT E. EBERT	Chicago, Ill.

OFFICERS OF THE COUNCIL.

JOSEPH P. REMINGTON, Chairman. C. L. DIEHL, Vice-Chairman.
GEORGE W. KENNEDY, Secretary.

COMMITTEES OF THE COUNCIL.

On Membership: GEORGE W. KENNEDY, Chairman,
HENRY J. MENNINGER,
JOSEPH ROBERTS,
JOS. S. EVANS,
A. E. EBERT,
THE TREASURER AND PERMANENT SECRETARY OF THE ASSOCIATION, *ex-officio.*

On Finance: SAMUEL A. D. SHEPPARD, Chairman,
JOSEPH L. LEMBERGER,
ALBERT H. HOLLISTER,

On Publication: JOSEPH P. REMINGTON, Chairman,
A. B. PRESCOTT,
WILLIAM SAUNDERS,
HENRY J. MENNINGER,
JOHN M. MAISCH.

On Centennial Fund: JOSEPH ROBERTS, Chairman,
S. A. D. SHEPPARD,
JOHN M. MAISCH.

LIST OF OFFICERS OF THE ASSOCIATION,

SINCE ITS ORGANIZATION.

(*Deceased in Italics.*)

PRESIDENTS.

Daniel B. Smith	Philadelphia	1852–53
William A. Brewer	Boston	1853–54
William B. Chapman	Cincinnati.	1854–55
John Meakim	New York	1855–56
George W. Andrews	Baltimore	1856–57
Charles Ellis	Philadelphia.	1857–58
John L. Kidwell	Georgetown, D. C.	1858–59
Samuel M. Colcord	Boston	1859–60
Henry T. Kiersted	New York	1860–62
William Procter, Jr.	Philadelphia.	1862–63
J. Faris Moore	Baltimore	1863–64
William J. M. Gordon.	Cincinnati.	1864–65
Henry W. Lincoln	Boston	1865–66
Frederick Stearns	Detroit, Mich.	1866–67
John Milhau	New York	1867–68
Edward Parrish	Philadelphia	1868–69
Ezekiel H. Sargent	Chicago.	1869–70
Richard H. Stabler.	Alexandria, Va.	1870–71
Enno Sander	St. Louis	1871–72
Albert E. Ebert	Chicago.	1872–73
John F. Hancock	Baltimore	1873–74
C. Lewis Diehl	Louisville, Ky.	1874–75
George F. H. Markoe.	Boston	1875–76
Charles Bullock	Philadelphia.	1876–77
William Saunders	London, Ont.	1877–78
Gustavus J. Luhn	Charleston, S. C.	1878–79
George W. Sloan.	Indianapolis, Ind.	1879–80
James T. Shinn	Philadelphia.	1880–81
P. Wendover Bedford	New York	1881–82
Charles A. Heinitsh	Lancaster, Pa.	1882–83
William S. Thompson.	Washington, D. C.	1883–84
John Ingalls	Macon, Ga.	1884–85
Joseph Roberts.	Baltimore, Md.	1885–86

FIRST VICE-PRESIDENTS.

George W. Andrews	Baltimore	1852–53
George D. Coggeshall.	New York	1853–54
Henry T. Cummings	Portland, Me.	1854–55
Charles B. Guthrie	Memphis, Tenn,	1855–56
John L. Kidwell	Washington, D. C.	1856–57
James Cooke.	Fredericksburg, Va.	1857–58
Edward Squibb	Brooklyn, N. Y.	1858–59
William Procter, Jr.	Philadelphia.	1859–60

William J. M Gordon	Cincinnati.	1860–62
John Milhau	New York	1862–63
John M. Maisch	Philadelphia.	1863–64
Richard H. Stabler.	Alexandria, Va.	1864–65
George C. Close	Brooklyn, N. Y	1865–66
Edward Parrish.	Philadelphia.	1866–67
Robert J. Brown	Leavenworth, Kan	1867–68
Ferris Bringhurst	Wilmington, Del.	1868–69
Ferdinand W. Sennewald	St. Louis	1869–70
Fleming G. Grieve	Milledgeville, Ga.	1870–71
C. Lewis Diehl.	Louisville, Ky.	1871–72
Samuel S. Garrigues	East Saginaw, Mich	1872–73
William Saunders.	London, Ont.	1873–74
Joseph Roberts.	Baltimore	1874–75
Frederick Hoffmann	New York	1875–76
Samuel A. D. Sheppard	Boston	1876–77
Ewen McIntyre	New York	1877–78
Frederick T. Whiting	Great Barrington, Mass	1878–79
T. Roberts Baker.	Richmond, Va.	1879–80
George H. Schafer	Fort Madison, Ia.	1880–81
Emlen Painter	San Francisco	1881–82
John Ingalls	Macon, Ga.	1882–83
Charles Rice.	New York.	1883–84
John A. Dadd	Milwaukee, Wis	1884–85
Albert H. Hollister.	Madison, Wis	1885–86

SECOND VICE-PRESIDENTS.

Samuel M. Colcord.	Boston	1852–53
Alexander Duval	Richmond, Va.	1853–54
John Meakim	New York	1854–55
Charles Ellis	Philadelphia	1855–56
Frederick Stearns.	Detroit, Mich	1856–57
Samuel P. Peck	Bennington, Vt.	1857–58
James O'Gallagher	St. Louis	1858–59
Joseph Roberts.	Baltimore.	1859–60
William S. Thompson.	Baltimore.	1860–62
Eugene L. Massot	St. Louis	1862–63
Charles A. Tufts	Dover, N. H.	1863–64
Enno Sander.	St. Louis	1864–65
Elijah W. Sackrider	Cleveland, O.	1865–66
Ezekiel H. Sargent	Chicago.	1866–67
N. Hynson Jennings.	Baltimore	1867–68
Edward S. Wayne	Cincinnati	1868–69
John H. Pope	New Orleans.	1869–70
James G. Steele	San Francisco	1870–71
George F. H. Markoe.	Boston	1871–72
Edward P. Nichols	Newark, N. J	1872–73
John T. Buck	Jackson, Miss	1873–74
William T. Wenzell.	San Francisco	1874–75
T. Roberts Baker.	Richmond, Va.	1875–76
Gustavus J. Luhn.	Charleston, S. C	1876–77

John Ingalls	Macon, Ga.	1877–78
Henry J. Rose	Toronto, Can	1878–79
Joseph L. Lemberger	Lebanon, Pa.	1879–80
William S. Thompson	Washington	1880–81
George Leis	Lawrence, Kan	1881–82
Louis Dohme	Baltimore	1882–83
Frederick H. Masi	Norfolk, Va	1883–84
Henry Canning	Boston, Mass.	1884–85
Albert B. Prescott	Ann Arbor, Mich.	1885–86

THIRD VICE-PRESIDENTS.

C. Augustus Smith	Cincinnati.	1852–53
Charles B. Guthrie	Memphis, Tenn	1853–54
Joseph Laidley.	Richmond, Va.	1854–55
Henry F. Fish	Waterbury, Conn.	1855–56
Henry T. Kiersted	New York	1856–57
A. E. Richards	Plaquemine, La	1857–58
Robert Battey	Rome, Ga.	1858–59
Edwin O. Gale	Chicago.	1859–60
Theodore Metcalf	Boston	1860–62
J. Faris Moore	Baltimore.	1862–63
George W. Weyman	Pittsburgh	1863–64
Thomas Hollis	Boston	1864–65
Charles A. Heinitsh	Lancaster, Pa	1865–66
John W. Shedden.	New York.	1866–67
Daniel Henchman	Boston	1867–68
Albert E. Ebert	Chicago.	1868–69
Joel S. Orne	Cambridgeport, Mass	1869–70
Eugene L. Massot	St. Louis	1870–71
Matthew F. Ash	Jackson, Miss	1871–72
Henry C. Gaylord	Cleveland, O.	1872–73
Paul Balluff	New York	1873–74
Augustus R. Bayley.	Cambridgeport, Mass	1874–75
Christian F. G. Meyer.	St. Louis	1875–76
Jacob D. Wells.	Cincinnati.	1876–77
Emlen Painter	San Francisco	1877–78
William H. Crawford.	St. Louis	1878–79
Philip C. Candidus	Mobile, Ala	1879–80
William Simpson	Raleigh, N. C.	1880–81
John F. Judge	Cincinnati.	1881–82
William B. Blanding	Providence, R. I.	1882–83
Edward W. Runyon	San Francisco	1883–84
Charles F. Goodman	Omaha, Neb.	1884–85
Joseph S. Evans	West Chester, Pa.	1885–86

TREASURER.

Alfred B. Taylor	Philadelphia.	1852–54
Samuel M. Colcord	Boston	1854–56
James S. Aspinwall	New York	1856–57
Samuel M. Colcord	Boston	1857–59
Ashel Boyden	Boston	1859–60

Henry Haviland	New York	1860–63
J. Brown Baxley	Baltimore	1863–65
Charles A. Tufts	Dover, N. H.	1865–86

RECORDING SECRETARIES.

George D. Coggeshall	New York	1852–53
Edward Parrish	Philadelphia.	1853–54
Edward S. Wayne	Cincinnati.	1854–55
William J. M. Gordon	Cincinnati.	1855–59
Charles Bullock	Philadelphia.	1859–60
James T. Shinn.	Philadelphia.	1860–62
Peter W. Bedford.	New York	1862–63
William Evans, Jr.	Philadelphia.	1863–64
Henry N. Rittenhouse	Philadelphia.	1864–65
John M. Maisch	Philadelphia.	1865–86

CORRESPONDING SECRETARIES.

William Procter, Jr.	Philadelphia.	1852–53
William B. Chapman	Cincinnati.	1853–54
William Procter, Jr.	Philadelphia.	1854–57
Edward Parrish	Philadelphia.	1857–58
Ambrose Smith	Philadelphia.	1858–59
William Hegeman	New York	1859–60
Peter W. Bedford.	New York	1860–62
John M. Maisch	Philadelphia.	1862–63
Peter W. Bedford.	New York	1863–66

LOCAL SECRETARIES.

Peter Wendover Bedford.	New York, N. Y.	1866–67
Alfred B. Taylor	Philadelphia, Pa	1867–68
Henry W. Fuller	Chicago, Ill	1868–69
J. Faris Moore	Baltimore, Md	1869–70
William H. Crawford.	St. Louis, Mo	1870–71
Henry C. Gaylord	Cleveland, O	1871–72
Thomas H. Hazard	Richmond, Va	1872–73
Emil Scheffer	Louisville, Ky	1873–74
Samuel A. D. Sheppard	Boston, Mass	1874–75
Adolphus W. Miller.	Philadelphia.	1875–76
Henry J. Rose	Toronto, Can	1876–77
Jesse W. Rankin	Atlanta, Ga	1877–78
Eli Lilly.	Indianapolis, Ind.	1878–79
Charles F. Fish.	Saratoga Springs, N. Y	1879–80
William T. Ford	Kansas City, Mo	1880–81
Hiram E. Griffith.	Niagara Falls, N. Y.	1881–82
Charles Becker.	Washington, D. C	1882–83
Henry C. Schranck	Milwaukee, Wis	1883–84
George A. Kelly	Pittsburgh, Pa	1884–85
William B. Blanding	Providence, R. I	1885–86

REPORTER ON PROGRESS OF PHARMACY.

C. L. Diehl	Louisville, Ky	1873–86

AUTHORIZED AGENTS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Appointed by the President, in compliance with the following resolutions:

Resolved, That the President be directed to appoint authorized agents, where needed in the different States, for the collection of dues, distribution of the Proceedings, etc.; such agents to be designated by the Treasurer and Permanent Secretary of the Association, and a list of the agents to be published in the Proceedings. (Passed at Baltimore, 1870.)

Resolved, That the President of this Association be requested to appoint, in every locality where more than three members reside, a local agent, whose duty it shall be to aid the Treasurer in the collection of members' dues in his section, and to procure new members by placing before the pharmacists, and others eligible to membership, the great advantages that they will derive from associating themselves with this body. (Passed at Indianapolis, 1879.)

Resolved, That while it is desirable that the authorized agents shall at all times render their accounts as promptly as convenient, it is especially to be desired that they render a complete account to the Treasurer of such moneys as are in their hands on the first day of August and December in each year, in order that the Treasurer may be able to make his yearly accounts as full as possible. (Passed by Council, 1883.)

Alabama,	P. C. Candidus, cor. Dauphin and Cedar streets,	Mobile.
Arkansas,	Geo. W. Cabell, Congress and Bull streets,	Hot Springs.
California,	James G. Steele, 521 Montgomery street,	San Francisco.
Colorado,	Hugo R. Hartung, 230 Fifteenth street,	Denver.
Dist. of Columbia,	John A. Milburn, 1429 Pennsylvania avenue,	Washington.
Connecticut,	Charles A. Rapelye, 605 Main street,	Hartford.
	Warren A. Spaulding, 19 Church street,	New Haven.
	Luzerne I. Munson, Apothecaries' Hall,	Waterbury.
Delaware,	Linton Smith, cor. Seventh and Market streets,	Wilmington.
Georgia,	Theo. Schumann, Whitehall and Hunter streets,	Atlanta.
	Robert H. Land, 270 Broad street,	Augusta.
	John Ingalls, cor. Fourth and Poplar streets,	Macon.
Illinois,	E. H. Sargent, 125 State street,	Chicago.
	David G. Plummer, 6 Main street,	Bradford.
	Charles B. Allaire, 108 Main street,	Peoria.
Indiana,	Albert B. Buck,	Anderson.
	Henry J. Schlæpfer, Second and Main streets,	Evansville.
	George W. Sloan, 7 East Washington street,	Indianapolis.
	David Hilt, 84 Main street,	Lafayette.
	William C. Buntin, 600 Main street,	Terre Haute.
Iowa,	John W. Ballard, 106 West Second street,	Davenport.
	Theodore W. Ruete, 379 Main street,	Dubuque.

	Olaf M. Oleson, Market street,	Fort Dodge.
	George H. Schafer, 129 Front street,	Fort Madison.
	Silas H. Moore, 80 Fourth street,	Sioux City.
Kansas,	George Leis, 90 Massachusetts street,	Lawrence.
	Robert J. Brown,	Leavenworth.
Kentucky,	C. Lewis Diehl, cor. Third and Broadway,	Louisville.
	William H. Averill, 435 Main street,	Frankfort.
Louisiana,	Isaac L. Lyons, 42 Camp street,	New Orleans.
	Joseph T. Thibodeaux, Main street,	Thibodeaux.
Maine,	Noah S. Harlow, 4 Smith's Block,	Bangor.
	Edmund Dana, Jr., 373 Congress street,	Portland.
Maryland,	Robert Lautenbach, Eutaw and Saratoga streets,	Baltimore.
	Thomas W. Shryer, 103 Baltimore street,	Cumberland.
Massachusetts,	George M. Hoyt, 257 Columbus avenue,	Boston.
	Joel S. Orne, 493 Main street,	Cambridgeport.
	B. Frank Stacey, 51 Vine street,	Charlestown.
	Frederick T. Whiting, Main street,	Great Barrington.
	Freeman H. Butler, 141 Central street,	Lowell.
	Joseph W. Colcord, 153 Union street,	Lynn.
	Samuel O. Daniels, Main and Summer streets,	Natick.
	James E. Blake, 65 North Second street,	New Bedford.
	Joseph J. Estes, Union and Church streets,	Rockland.
	Thomas B. Nichols, 159 Essex street,	Salem.
	Joseph T. Webber, State and Main streets,	Springfield.
	William Bush, 56 Front street,	Worcester.
Michigan,	Ottmar Eberbach, 12 South Main street,	Ann Arbor.
	Theodore Ronnefeld, 195 Gratiot street,	Detroit.
	Henry Melchers, Genesee and Jefferson street,	East Saginaw.
Minnesota,	Karl Simmon,	St. Paul.
Mississippi,	Joseph W. Eckford, Commerce street,	Aberdeen.
	Matthew F. Ash,	Jackson.
Missouri,	James F. Hurt, Broadway,	Columbia.
	William T. Ford, 1305 Cherry street,	Kansas City.
	James M. Good, 2348 Olive street,	St. Louis.
Nebraska,	Charles F. Goodman, 180 Farnham street,	Omaha.
Nevada,	William A. Perkins, 213 Main street,	Virginia City.
New Hampshire,	Bayard T. Perry, 1088 Elm street,	Manchester.
	E. S. Russell, 69 Main street,	Nashua.
	Joseph H. Thatcher, 12 Market street,	Portsmouth.
New Jersey,	Albert P. Brown, cor. Fifth and Federal streets,	Camden.
	Jonathan B. Drake, 132 Broad street,	Elizabeth.
	Hermann Klussmann, Fourth street and Lafayette avenue,	Hoboken.
	Maxwell Abernethy, 188 Newark avenue	Jersey City.
	Charles B. Smith, 831 Broad street,	Newark.
	Robert E. Parsons, 19 Main street,	Orange.
	Howard P. Reynolds, Front and Cherry streets,	Plainfield.
	G. A. Mangold, 4 East State street,	Trenton.

New York,	Charles H. Gaus, 202 Washington avenue,	Albany.
	G. C. Close, 67 Cumberland street,	Brooklyn.
	Charles O. Rano, 1872 Niagara street,	Buffalo.
	William L. DuBois, 281 Main street,	Catskill.
	James T. King, cor. Main and South streets,	Middletown.
	Daniel C. Robbins, 91 Fulton street,	New York.
	G. H. Haass, 38 Main street,	Rochester.
	John G. Bissell, 45 Dominick street,	Rome.
	Charles F. Fish, 114 Broadway,	Saratoga.
	George Duryee, 191 State street,	Schenectady.
	Charles W. Snow, 28 East Genesee street,	Syracuse.
	William Blaikie, 202 Genesee street,	Utica.
North Carolina,	William Simpson, 33 Fayetteville street,	Raleigh.
	James C. Munds, Third street,	Wilmington.
Ohio,	Andrew M. Armstrong, 106 East Market street,	Akron.
	Walter H. Howson, Water street,	Chillicothe.
	J. U. Lloyd, N. W. cor. Court and Plum streets,	Cincinnati.
	Henry C. Gaylord, 110 Monument square,	Cleveland.
	Charles Huston, 43 South High street,	Columbus.
	Thomas J. Casper, 41 East Main street,	Springfield.
	Charles Hohley, 248 South street,	Toledo.
	Edgar M. Hatton, Fifth and Main streets,	Zanesville.
Pennsylvania,	Jacob A. Miller, cor. Second and Chestnut streets,	Harrisburg.
	Charles A. Heinitsh, 16 East King street,	Lancaster.
	Joseph L. Lemberger, 8 North Ninth street,	Lebanon.
	Francis W. Walker, Jr.,	New Brighton.
	Rich. M. Shoemaker, cor. Fourth and Race streets,	Philadelphia.
	James B. Cherry, 23 Fourth avenue,	Pittsburgh.
	Philip M. Ziegler, 526 Penn street,	Reading.
	Edward A. Cornell, Tenth and Pine streets,	Williamsport.
Rhode Island,	James H. Taylor, 104 Thomas street,	Newport.
	Albert L. Calder, 163 Westminster street,	Providence.
South Carolina,	Gustavus J. Luhn, Post-office Box No. 582,	Charleston.
Tennessee,	Jas. S. Robinson, cor. Third and Madison streets,	Memphis.
	John C. Wharton, 38 Union street,	Nashville.
Texas,	Thomas W. Powell, 10 Houston street,	Fort Worth.
Virginia,	Frederick H. Masi, cor. Main and Granby,	Norfolk.
	T. Roberts Baker, 919 East Main street,	Richmond.
West Virginia,	Edwin L. Boggs, Kanawha Bank Building,	Charleston.
	Edmund Bocking, 1 Odd Fellows' Hall,	Wheeling.
Wisconsin,	John R. Drake, 255 South Water street,	Milwaukee.
Prov. Nova Scotia,	Francis C. Simson,	Halifax.
Prov. Ontario,	George Hodgetts, 305 Yonge street,	Toronto.
Prov. Quebec,	Henry R. Gray, 144 St. Lawrence Main street,	Montreal.

AMENDMENT TO ARTICLE IV. OF THE CONSTITUTION.

Proposed by Messrs. Maisch and Ebert (see page 576), and to be acted on at the Thirty-fourth Annual Meeting.

Add after the words, "received from," in first line, the words "entrance fees and," so as to make the Article read: All moneys received from entrance fees and life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the annual interest of which only shall be used by the Association for its current expenses.

LIST OF QUERIES

TO BE ANSWERED AT THE THIRTY-FOURTH ANNUAL MEETING, TO BE HELD AT PROVIDENCE, R. I., SEPTEMBER 7, 1886.

☞ Members intending to investigate one or more of the following subjects, or to present a volunteer paper at the next meeting, are requested to inform the Chairman of the Committee, J. U. Lloyd, Court and Plum streets, Cincinnati, O.

1. Some remarks are desired on the distillation of water by pharmacists in order to meet the Pharmacopœial requirements. Also a description of the various forms of distilling apparatus, with notes on their merits or defects.

2. A paper on the best practical method to determine melting points is desired.

3. Would it not be desirable to make some of the medicated waters of the Pharmacopœia by distillation from the drug instead of from the oils?

4. Is there any difference in the value of the large (Texan) and the small Serpentaria?

5. A preparation of commerce is now sold under the name of Concentrated Nitrous Ether. Is it possible to keep such a substance in order to prepare the spirit extemporaneously?

6. What is the proportion of Nitrous Ether in the officinal Concentrated Nitrous Ether of the Pharmacopœia?

7. Report on commercial Chloric Ether.

8. Citrate of Hydrastine (the white alkaloid of hydrastis) is precipitated by an alkali. Citrate of Bismuth is precipitated from the ammonio-citrate of bismuth solution, by an acid. Preparations purporting to contain these two substances in associated solution are in commerce. What do they contain? (See Prof. Power's remarks, Proceedings 1884, p. 512.)

9. Could Benzoic or Cinnamic Acid be employed in place of Benzoin, in the preparation of Benzoinated [Benzoated] Lard? Do the preservative properties of Benzoin reside in the acid, or do the other constituents have a share in the properties?

10. Preparations miscible with water, forming clear solution, are now made by some pharmacists and manufacturers, under the name "Soluble Tincture," or "Soluble Fluid Extract of Tolu." These liquids produce a pleasant syrup, seemingly equal in flavor to the officinal. Is it desirable to modify our officinal process for making Syrup of Tolu?

11. Examine the commercial preparations professing to contain unaltered and medicinally active Phosphorus. Devise a plan of assay which shall permit an estimation of the quantity of unaltered Phosphorus present.

12. An examination of the Cream of Tartar of American manufacturers is desired.

13. Does the commercial Compound Spirit of Ether contain the Ethereal Oil as required by the Pharmacopœia?

14. Does the Ethereal Oil [Oleum Æthereum, U. S. P.], add any marked therapeutical value to Hoffman's Anodyne?

15. A paper on the determination of Ethereal Oil [Oleum Æthereum, U. S. P.], is desirable.

16. Can not a more economical process than the officinal be suggested, for making Ethereal Oil?

17. What is the "Light Oil of Wine" sold in the market?

18. Not unfrequently physicians prescribe, in one mixture, solution of Arsenite of Potassium and Tincture of Chloride of Iron. What, if any, action or reaction do these two compounds exert upon each other, and are they incompatible therapeutically, or not?

19. What process is best employed for estimating the quantity of glycerin in solid or semi-solid, unctuous or soapy mixtures, for instance in the commercial glycerin soaps, cold-cream, etc.?

20. Chloride of Carbon is often ordered. What is the preparation desired?

21. What are the Scale Pepsins of commerce?

22. A paper on the tests for Brucine in the presence of Strychnine, and for Strychnine in the presence of Brucine, is desirable. Also a plan for the perfect separation of the alkaloids.

23. Does commercial Brucine contain Strychnine?

24. Is Brucine poisonous?

25. Powdered Guaiac and Gallic Acid have recently been pointed out as two of the substances which are peculiarly affected by exposure to light. What, if any, change do they undergo under the influence of light?

26. Are the Compound Cathartic Pills of commerce prepared in accordance with the U. S. P.?

27. A paper on pharmaceutical preparations of Permanganate of Potassium is desired.

28. Calx Sulphurata (U. S. P.) deteriorates when exposed to the air. What are the products of the decomposition? What is the composition of freshly prepared specimens and of such as are sold in the market? How much unaltered sulphurated lime do the ready-made "sulphide of calcium" pills of the market contain?

29. Is it desirable to replace the Sulphate of Quinine with the Bisulphate, or with the effloresced Sulphate?

30. Syrup of the Phosphates of Iron, Quinine and Strychnine, made by the present U. S. P. process, undergoes a change on standing. Can this be prevented and a permanent preparation made?

31. Is it desirable that a Citrate of Iron and Quinine, containing Ammonia, be made officinal?

32. Some of the working formulæ of the double Salts of Iron (scale salts) in the U. S. Pharm. are said to be wrong in the proportions directed to be used. Examine this subject critically.

33. To what extent is it desirable to protect the interest of pharmacists or chemists who invent new processes having commercial values?

34. What is the true nature and composition of the substance sold by German manufacturing chemists as *Natrium choleinicum* or *Fel taurinum depuratum*, and known here as choleinate of sodium?

35. Tauro-cholate and Glyco-cholate of Sodium are very effective cholagogues. Do they represent the full activity of ox-gall?

36. What is the quality of commercial Powdered Cinnamon?

37. Examine the commercial grades of Honey as to purity.

38. Neutral-tint Litmus Paper is at present much in vogue, and preferred by many chemists to the two shades of blue and red heretofore used. How is it best prepared, and what kinds of paper are most suitable for it?

39. What proportion of the Cherry Laurel Water dispensed is made of Bitter Almond Oil?

40. When bright metallic lead is suspended in Olive Oil, a precipitate follows, and a light colored oil can be decanted. This oil is said to be preferred by gunsmiths. What is the reaction, and has it superior qualities as a non gumming lubricant?

41. What are the most efficient preparations which may be prepared from the pancreas? Give their method of preparation, and tests for their activity and purity.

42. Is it practical for dispensing pharmacists to prepare, on a small scale, preparations of pepsin or pancreatin?

43. It is important that the next Committee of Revision of the U. S. Pharm. (which will go into office in 1890) should possess reliable statistics as to the relative frequency with which the different articles of the Pharmacopœia are prescribed by the medical profession. It is desired that pharmacists having large dispensing practice, and located in various parts of the country, should prepare or cause to be prepared by trustworthy assistants reliable lists of ingredients in prescriptions presented and dispensed at their establishments, giving the number of times each substance has been called for, and such other information as may be of general interest. The inquiry should extend over a series of successive prescriptions since the new Pharmacopœia went into force. Should not the members of the A. P. A. take a concerted action on the subject? Suggest a plan.

44. Make a critical comparison of Menhaden oil and Cod-liver oil, also of mixtures of these two oils, with a view of finding a method of distinguishing them from each other, or recognizing them in a mixture.

45. What is the average quality of the Cod Liver Oil of commerce?

46. What kinds and grades of Cod-liver Oil does the present market afford? Examine the different kinds with a view of ascertaining what are the most reliable tests for its purity and genuineness.

47. Has the so called "Distilled Extract of Hamamelis" any medicinal value that would not be derived from alcohol and water, mixed in the same proportion as they exist in this so-called Extract?

48. Is Digitalis raised in America equal, therapeutically, to that raised in England, or to that grown wild?

49. Commercial Mercury with Chalk is said to be frequently contaminated with oxide of mercury, and thereby rendered injurious. Examine samples obtained in the market for oxide.

50. What advantage is there in coloring certain elixirs; for example, Elixir of Valerianate of Ammonium?

51. How do the proportions by actual weights and measures given in the several dispensatories coincide with the proportions by weight given by the Pharmacopœia in the officinal working formulæ?

52. Is it feasible to give in the Pharmacopœia *both* methods, viz., in parts by weight and in actual weight or measure. perhaps so that one set of proportions or figures is placed in front and the other behind the ingredients?

53. It is said that when Iodine Ointment is made by means of Petrolatum, the Iodine undergoes some change. What is the reaction?

54. A paper on the preparation and purification of Oil of Cloves is desired.

55. What is the quality of Commercial Oil of Cloves?

56. A paper on Commercial Oil of Lemon is desired.

57. The green color in Oil of Cajeput is generally due to copper, sometimes to chlorophyll. Is the contamination with copper still prevailing, and if so, how much copper does the oil contain, or how much can it take up, and in what condition does the copper exist in the oil?

58. To what extent is Oil of Camphor consumed in America, and for what purpose?

59. A paper on Sassafras Camphor is desired.

60. Are commercial Volatile Oils adulterated to any extent?

61. Advertisements of oil houses frequently mention so-called "Neutral Oil," impliedly or openly offered for sale as a good substitute or adulterant of other oils. What is the nature of this neutral oil? And do the products offered by different firms differ from each other?

62. What becomes of the residue that is left in making Menthol from Oil of Peppermint?

63. The menthol or "mentholine" preparations of the market are said to be more or less contaminated with foreign ingredients. How may the contaminations or additions be detected?

64. Is Japan Menthol superior to that made of American Peppermint Oil?

65. What is the difference between White and Red Oil of Thyme?

66. Is the Thymol of Oil of Monarda identical with that obtained from Oil of Thyme?

67. How do the Crystals and the Crusts of Chloral Hydrate compare with each other?

68. Some notes concerning the Carbolic Acid made in America.

69. A paper on the creasotes of commerce is desired.

70. Do the Castor Oil capsules sold in the market correspond with the ingredients named on the label; and, if their composition is not given on the label, what do they contain?

71. Is pure Oleic Acid for the preparation of Oleates equal to an acid which contains a portion of Stearic Acid?

72. A paper on the Chemistry of Oleates as made by precipitation of soap solution and by the action of Oleic Acid on metallic oxides is desirable.

73. An examination of "Rock Candy Syrup" of commerce, and a comparison with Simple Syrup, is desired.

74. Is the present officinal formula for making Ammonia Liniment satisfactory?

75. What is the difference in value between Crude Iodine and Resublimed Iodine?

76. How may a concentrated unalterable solution of Iodide of Iron (ferrous iodide) be prepared so that it may be used for the extempore preparation of the syrup?

77. Can pills of Iodide of Iron be made to keep; and, if so, explain process? Will the U. S. P. process answer?

78. Is there any appreciable difference in the solubility of the commercial salts of morphine?

79. Is Glucose substituted in the preparation of commercial medicated syrups?

80. What is the most desirable melting point for Petrolatum?

81. What are the contaminations of commercial Salicylic Acid?

82. When Salicylic Acid is made by decomposing Oil of Wintergreen with Caustic Potash, a volatile substance escapes, having the exact odor of a volatile body that escapes from fresh willow bark. What is this?

83. What is the best Paste for labeling bottles, and how can paste be best preserved?

84. What proportion of soil adheres to commercial indigenous roots?

85. Crystallized Tartaric Acid is now an article of commerce, and is preferred by some persons who consume considerable amounts of it. Is there any difference between the crystals and the powdered?

86. A paper on the preparations and drugs of the U. S. P. in little or no demand is desired.

87. To what extent is the ethical code of the regular medical profession applicable to the pharmacist?

88. What menstruum is best adapted to extract and hold in solution the desirable principles of Licorice Root?

89. What should be the relation between wholesale druggists, manufacturing chem-

ists, and pharmacists and dispensing pharmacists, as to the maintenance of proper standards of purity, quality and strength of medicinal substances?

90. Glucose Syrup seems to have some value of its own, perhaps not yet appreciated in pharmacy. Would it be a desirable substitute for cane-sugar syrup, in any pharmacopœial or non-officinal preparation?

91. An alcoholic solution of Nitro-glycerin is coming into more extended use as a remedy in asthma, nephritis, etc. It is usually sold of the strength of 1 %. How may it be assayed?

92. It is said that a process is being worked at present by which cotton-seed oil is deprived of the drying portion. What is the process?

93. The German bromine and bromides are lauded on the Continent of Europe to be almost (or entirely?) free from chlorine and chlorides, and therefore greatly preferable to the American products. What is the average percentage of chlorine in the German and American bromine and bromides?

94. Which of the modern antiseptic dressings can be prepared with advantage and profit by the retail pharmacist?

95. A good process for determining Tannin is desired.

96. A paper on the use of Methyl Alcohol in the preparation of Chloroform is desired.

97. Does Cannabis Indica contain Nicotine?

98. What is the quality of the Cannabis Indica of commerce? Will it make a green tincture, U. S. P.? .

99. Is the green colored extract of Cannabis made of the imported herb?

100. Is it not feasible to prepare concentrated liquid preparations from many drugs, which need only be diluted with the appropriate menstruum to bring them to the officinal strength, without having them differ in any important point from the weaker preparations directed by the U. S. Pharmacopœia?

101. Examine the different methods that have been proposed for destroying or mitigating the odor of iodoform, and ascertain whether any of these alter its properties and composition?

102. What is the best diluent of iodoform which will not interfere with its full action, and will deprive it of disagreeable odor?

103. What is the quality of the Belladonna Leaves of commerce?

104. What proportion of the Cinchona Barks of commerce, will answer the Pharmacopœial tests?

105. What is the chemical nature of the acrid principle of Mezereon bark?

106. What is the active principle of Arnica?

107. Commercial Oil [Oleoresin] of Male Fern deposits a sediment. Is the sediment or the overlying oil the desirable portion?

108. A paper on the bitter principle of Anthemis nobilis is desired.

109. What is the quality of the Balsam of Tolu of commerce?

110. What amount of sand is present in commercial Asafœtida? A comparison of different specimens is desired.

111. California Insect Powder is said to be more active and insecticidal than the Dalmatian or other imported. Is this so? And, if so, to what is the increased activity due?

112. What are the statistics of the domestic cultivation of the plants used as "Insect Powder"?

113. Examine the Bismuth Salts of the market, with a special view of ascertaining the proportion of arsenic they may contain, and also of controlling the accuracy and reliability of the tests for arsenic as given in the U. S. Pharm.

114. Report on the commercial scale Salts of Iron.

115. Report on the quality of the Cacao Butter of commerce.

116. What proportion of the Olive Oil of commerce is Olive Oil?

117. Is pure Olive Oil superior for table use to fixed Oil of Mustard (now largely bottled and sold for table purposes)?

118. What proportion of Fusel Oil is present in commercial Alcohol?

119. What amount of Alcohol is lost in the various methods of recovering it from the dregs of tinctures and fluid extracts?

120. Is Wood Alcohol substituted for Alcohol by any who prepare Pharmaceuticals?

121. Name a process for making a good odorless disinfectant liquid.

122. An examination of commercial bicarbonate of sodium is desired.

123. Examine the powdered opium of the shops.

124. Certain States have enacted laws requiring colored labels to be used on all morphine preparations. Even now they conflict in color requirements, and unless some united action is taken, much trouble will be involved in the shipping of morphine to various States. Concerted action may be brought about by our Association. A paper on the subject is desired.

125. Should not the commercial side and trade relations of pharmacy be left as fully as possible to the consideration and action of those members of pharmaceutical associations who are actually engaged in the business of retail pharmacy?

126. Is the officinal Bisulphate of Quinine (1 mol. quinine, 1 mol. sulphuric acid), as obtained in commerce, to any extent replaced by the Hypersulphate (1 mol. quinine, 2 mol. sulphuric acid)?

CONTENTS.

PAGE

Prefatory Notice 21
List of Members present at the Thirty-second Annual Meeting 23

Report on the Progress of Pharmacy.

Introduction 25
Pharmacy: A. Apparatus and Manipulation 33
B. Preparations 59
Materia Medica: A. Vegetable Drugs 100
B. Animal Drugs 198
Inorganic Chemistry 206
Organic Chemistry 251

Reports of Committees.

Report of the Committee on the Drug Market. By M. N Kline 361
Report of Committee on Legislation 374
Pharmacy Act of Kansas 378
Prohibitory Law of Kansas 381
Amended Pharmacy Law of Maine 382
Pharmacy Law of Massachusetts 384
Pharmacy Act of Michigan 385
Pharmacy Act of Minnesota 388
New Penal Code of the State of Minnesota, sections 326 to 332 392
Report of the Committee on Legislation on Proprietary Medicines 394
Proposed Act to regulate the sale of Proprietary Medicines 396

Special Reports and Essays.

I. Pharmacy:

1. Pharmaceutical Steam-boiler. Correction. By Edgar L. Patch 399
2. Percolation. Experiments and Answers to Criticisms. By N. Rosenwasser 399
3. Two or Three Pharmaceutical Notes. By Henry G. Cummings 407
4. Precipitates in Fluid Extracts. By J. U. Lloyd 411
5. On the Use of Fluid Extracts for Making Other Pharmaceutical Preparations. By Otto A. Wall 419
6. Our Abstracts. By F. Coblentz 424
7. Infected Solutions. By R. G. Eccles 429
8. Note on the Fungoid Growth in Dilute Phosphoric Acid. By L. E. Sayre 446
9. Assaying Tincture of Opium. By Wm. W. Bartlet 446
10. Assaying Tincture of Opium. By Edgar L. Patch 448
11. On the Coloring of Elixirs. By James W. Caldwell 452
12. Quinine in Elixir. By Joseph Feil 453
13. On Elixir of Calisaya Bark. By Edmund Bocking 454
14. Preservation of Mucilage of Acacia. By Thomas W. Watkins 458
15. Pills of Potassium Permanganate. By Edgar L. Patch 459
16. Pills of Nitrate of Silver. By Edgar L. Patch 460
17. On Diachylon Ointment. By J. M. Good 461
18. Diachylon Ointment. By Edgar L. Patch 463
19. Oleate of Mercury. By Emlen Painter 465
20. An Examination of the Menthol Cones of the Market. By P. W. Bedford 470

II. Chemistry:

21. Stick Caustic Potash of Commerce. By Edward Goebel 472
22. Stick Caustic Potash of Commerce. By Edgar L. Patch 474
23. Liquor Ferri Nitratis. By Louis Dohme 475
24. Commercial Calomel. By Edgar L. Patch 476
25. Calomel. By P. W. Bedford 477
26. Black Antimony of Commerce. By Rob. B. Warder 479
27. Tartar Emetic of Commerce. By Rob. B. Warder 480
28. Glycerin of Commerce. By Edward Goebel 481
29. Glycerin of Commerce. By Edgar L. Patch 484
30. Glycerin of Commerce. By Rob. B. Warder 486
31. Commercial Chloroform. By P. W. Bedford 492

III. Materia Medica:

32. Exportation of American Drugs. By Louis A. Haber 493
33. Arctic Vegetation. By George W. Kennedy 495
34. Dandelion and Chicory. By Joseph Feil 496
35. On the Medical Properties of two Rhamnus Barks. By George W. Kennedy 497

PAGE
36. On the Volatile Oils of Peppermint and Spearmint. By Henry Trimble 501
37. Imported Menthol. By P. W. Bedford 504
38. On the Purity of Commercial Spanish Saffron. By John M. Maisch 504

MINUTES OF THE THIRTY-THIRD ANNUAL MEETING.

Minutes of the First Session :

Address by Mr. G. H. Anderson 512
Annual address by President John Ingalls 513
Entertainments ; Report on delegations 516
Invitations received and extended ; Address by Mr. Kline 517
Reply by Mr. Sheppard. 518
Appointment of Nominating Committee 519
Minutes of the Council 520
Report of Committee to examine Treasurer's books, 1884 521
Report of the Finance Committee 523
Special Report of the chairman on Investments 525
Report of the Examining Committee, 1885 525
Annual Report of the Finance Committee 526
Report of the Committee on Membership. 529
Report of the Committee on Publication 537
Report of the Committee on Prize Essays ; Committees appointed 538

Minutes of the Second Session :

Telegram to the British Pharmaceutical Conference ; Credentials received, ... 538
Minutes of the Council : members elected ; amendments acted on 539
Report of the Nominating Committee 539
Election and installation of officers 540
Report on the drug market read and discussed 541
Treasurer's Report 544
Reports of committees read 549
Amendments to the By-laws acted on 550

Minutes of the Third Session :

Invitations received ; Committee on Next Annual Meeting 554
Minutes of the Council : Organization ; Election of Members. 555
Resolution on manufactured pharmaceuticals offered and discussed 555
Reconsideration of vote on Treasurer's salary 557
Proposition for a National Formulary of unofficinal preparations 558
Discussion on this proposition. 559
Discussion on pills of potassium permanganate 564
Discussion on pills of silver nitrate 565
Discussion on tincture of opium and its assay. 566
Telegram from British Pharmaceutical Conference. 570
Discussion of paper on precipitates in fluid extracts. 570
Discussion of infected solutions 572

Minutes of the Fourth Session :

Minutes of the Council : election of members 573
Next annual meeting : place, time and arrangements 573
Committee appointed ; National Formulary discussed. 574
Committee appointed ; report on President's address 575
Amendment to the Constitution offered ; discussion on oleate of mercury 576
Telegram from California ; nominations ; letter from Samuel F. Troth 577
Discussion on diachylon ointment. 578
Remarks on oil of peppermint. 579
Resolutions of thanks ; papers referred for publication 580
Minutes of Council : election of members, etc 581
Entertainments. 581

APPENDIX.

New York and Brooklyn Formulary of Unofficinal Preparations 583
List of Colleges and Associations accrediting delegates 613
List of Publications received 615
List of Societies, etc., receiving complimentary copies of Proceedings 616
Constitution and By-Laws of the American Pharmaceutical Association 619
By-Laws of the Council. 628
Form of Application for Membership 631
General Rules on Finance. 632
Roll of Members 633
Alphabetical List of Members 656
List of Resignations 681
List of Deceased Members 681
Index 682

PREFATORY NOTICE.

Though portions of the manuscript were not received until in the months of January and February, the editor was enabled to complete the arrangements for printing the Proceedings towards the middle of November, and to continue the work to its completion without material interruption. The wood-cuts used for illustration were loaned by the publishers of the "American Druggist," the "American Journal of Pharmacy," the "Pharmaceutical Record," and the "Druggists' Circular;" one was furnished by Prof. Lloyd, and a limited number had to be specially made.

The frontispiece issued with the present volume, is the portrait of Henry B. Parsons, whose untimely death took place a few weeks before the last annual meeting. On page 535 of the present volume will be found a brief biographical sketch of him, who, when dying in his thirtieth year, had gained an excellent reputation for the enthusiasm, energy, and accuracy displayed in his scientific labors—qualities which promised a bright future for him.

The prices of the several issues of the Proceedings now on hand, *including postage*, are:

	Unbound.	Bound.
1851, 1852, 1853, 1854, 1855, each	$0 25	
1857,	50	$0 75
1858,	1 50	1 75
1859,		1 75
1860,		1 25
1862, 1863, each		1 50
1864, 1865, 1866, each	1 50	1 80
1867,	2 20	2 50
1868, 1869, 1870, each	2 50	3 00
1871,	4 50	5 25
1872,	2 50	3 00
1873, 1874, each	5 00	5 50
1875, 1876, each	7 00	7 50
1877,	6 00	6 50
1878, 1879, each	7 00	7 50
1880,	6 00	6 50
1881,	5 50	6 00
1882,	6 00	6 50
1883,	5 00	5 50
1884, 1885, each	5 50	6 00

1856 out of print; none published in 1861.

The Publishing Committee offer the Proceedings from 1851 to the present time in sets of five or more volumes at the following prices, *exclusive of postage or express charges:*

For any 5 volumes	a discount of	20	per cent.	on the	above prices.
“ 10 “	“	30	“	“	“
“ 20 “	“	40	“	“	“
For the whole set	“	50	“	“	“

All orders for Proceedings should be addressed to the Permanent Secretary, John M. Maisch, 143 North Tenth street, Philadelphia, Pa.

The price of the nickel badge has been reduced by vote of the Council to 25 cents, on receipt of which sum by the Permanent Secretary, the badge will be sent by mail.

The Thirty-third Annual Meeting will be held in Providence, R. I., on the first Tuesday (7th day) of September, 1885, at 3 o'clock, p. m. Blank applications for membership may be obtained from the Authorized Agents or from the Permanent Secretary. Applications properly filled should reach the chairman of the Committee on Membership, George W. Kennedy, Pottsville, Pa., on or before September 1st; if sent later they should be addressed to the care of the Local Secretary, William B. Blanding, Providence, R. I. The fees should be sent by postal money order, by draft or by bank-check.

In addition to a number of delegates to the last meeting who became members by election, Dr. A. B. Lyons, Detroit, Mich., a delegate from the Michigan Pharmaceutical Association, became a member by signing the Constitution and By-Laws, as required by Chapter VIII, Article VI, of the By-Laws.

LIST OF MEMBERS AND DELEGATES IN ATTENDANCE AT THE THIRTY-THIRD ANNUAL MEETING.

Names of Delegates are indicated by an asterisk (*).

E. A. Alleman, Milton, Pa.
*A. W. Allen, Detroit, Mich.
*E. F. Allen, Minneapolis, Minn.
J. H. Andrews, Seymour, Ind.
A. Armor, Allegheny City, Pa.
A. M. Armstrong, Akron, O.
*H. W. Atwood, New York.
T. Roberts Baker, Richmond, Va.
Walter F. Baker, Philadelphia.
*Gustavus Balser, New York.
Z. T. Baltzly, Massillon, O.
*W. W. Bartlet, Boston.
C. H. Beach, Pittsburgh.
*P. W. Bedford, New York.
*Edmund Bocking, Wheeling, W. Va.
Emil L. Boerner, Iowa City, Ia.
*Robert J. Brown, Leavenworth, Kan.
*James W. Caldwell, Detroit.
James B. Cherry, Pittsburgh.
Virgil Coblentz, Springfield, O.
*J. W. Colcord, Lynn, Mass.
*Adam Conrath, Milwaukee.
Thos. P. Cook, Philadelphia.
J. V. D. Coon, Olean, N. Y.
*David M. R. Culbreth, Baltimore.
Chas. W. Day, Springfield, Ill.
*William P. DeForest, Brooklyn, N. Y.
*C. Lewis Diehl, Louisville, Ky.
*William C. Durkee, Boston.
*Albert E. Ebert, Chicago, Ill.
*Robert G. Eccles, Brooklyn, N. Y.
*Jos. W. Eckford, Aberdeen, Miss.
Fred. H. Eggers, Allegheny City, Pa.
Leo Eliel, South Bend, Ind.
*H. A. Elliott, Baltimore.
Louis Emanuel, Pittsburgh.
*C. V. Emich, Baltimore.
*Jos. S. Evans, West Chester, Pa.
*Levi Fahnestock, Pittsburgh.
*Joseph Feil, Cleveland, O.
*A. K. Finlay, New Orleans, La.
A. T. Fleischmann, Sedalia, Mo.
*J. M. Good, St. Louis, Mo.
W. J. M. Gordon, Cincinnati.
*George A. Gorgas, Harrisburg, Pa.
*Edmund Gregory, Lindsay, Ont.
*T. L. A. Greve, Cincinnati, O.
Louis A. Haber, Cleveland, O.
*C. S. Hallberg, Chicago.
Edgar M. Hatton, Zanesville, O.
*Chas. A. Heinitsh, Lancaster, Pa.
Chas. H. Hobart, New York.
S. S. Holland, Pittsburgh.
*A. H. Hollister, Madison, Wis.
*Clay W. Holmes, Elmira, N. Y.
J. T. Hoskinson, Jr., Philadelphia.
Chas. M. Hostetter, Pittsburgh.
Chas. Huston, Columbus, O.
*John Ingalls, Macon, Ga.
*Edward C. Jones, Philadelphia.
Geo. B. Kauffman, Columbus, O.
W. H. Keck, Allegheny City, Pa.
Geo. A. Kelly, Pittsburgh.
Geo. W. Kennedy, Pottsville, Pa.
Thos. Kennedy, New Brighton, Pa.
*James Kerr, Jr., Pittsburgh.
*G. H. C. Klie, St. Louis, Mo.
M. N. Kline, Philadelphia.
Aug. Knoefel, New Albany, Ind.
Philipp Lehr, Cleveland, O.
*J. U. Lloyd, Cincinnati.
*A. B. Lyons, Detroit.
*Geo. McDonald, Kalamazoo, Mich.
J. M. McNeil, Scottdale, Pa.
*T. J. Macmahan, New York.
*Thos. F. Main, New York.
John M. Maisch, Philadelphia.
*Geo. F. H. Markoe, Boston.
*F. H. Masi, Norfolk, Va.
H. J. Menninger, Brooklyn, N. Y.
S. H. Moore, Sioux City, Ia.
*A. Nattans, Washington, D. C.

*Louis E. Nicot, Brooklyn, N. Y.
John A. Nipgen, Chillicothe.
Wm. W. Nisbet, Pittsburgh.
Oscar Oldberg, Chicago.
*Emlen Painter, New York.
R. E. Parsons, Orange, N. J.
T. H. Patterson, Chicago.
Geo. L. Peck, Jamaica, N. Y.
*F. W. R. Perry, Detroit, Mich.
*H. C. Porter, Towanda, Pa.
*A. B. Prescott, Ann Arbor, Mich.
*Wallace Procter, Philadelphia, Pa.
*H. H. Rademaker, Louisville, Ky.
C. O. Rano, Buffalo, N. Y.
*Paul Reinlein, Washington, D. C.
*Jos. P. Remington, Philadelphia.
*Chas. Rice, New York.
*C. F. Rickey, Mount Sterling, Ill.
Randal Rickey, Trenton, N. J.
*Alonzo Robbins, Philadelphia.
*Joseph Roberts, Baltimore.
A. C. Robertson, Allegheny City, Pa.
*Nathan Rosenwasser, Cleveland, O.
*Edward W. Runyon, San Francisco.
*Edward A. Sayre, Brooklyn, N. Y.
L. E. Sayre, Lawrence, Kan.
Mat. M. Schneider, Pittsburgh.
*Geo. J. Seabury, New York.
*S. A. D. Sheppard, Boston.
*Karl Simmon, St. Paul, Minn.
*Geo. W. Sloan, Indianapolis.
Frank L. Slocum, Pittsburgh.
*Rich. M. Sommers, Philadelphia.
*A. B. Stevens, Detroit.
S. Henry Stevens, Pittsburgh.
*W. S. Thompson, Washington, D. C.
*A R. Thurber, Ashtabula, O.
Albert M. Todd, Nottawa, Mich.
Wm. J. Todd, Pittsburgh.
*J. A. Treat, Stuart, Ia.
Henry Trimble, Philadelphia.
*Chas. A. Tufts, Dover, N. H.
*Jos. G. Underhill, Brooklyn.
*F. W. Walker, Jr., New Brighton, Pa.
*J. R. Walton, Washington, D. C.
*W. M. L. Weills, Harrisburg, Pa.
Oscar C. Weinman, New York.
*J. D. Wells, Cincinnati.
*H. M. Whelpley, St. Louis.
F. T. Whiting, Great Barrington, Mass.
Albert H. Wilson, Pittsburgh.
*J. H. Wilson, Chicago.
E. C. Winslow, Danville, Ill.
Jonas Winter, Hagerstown, Md.
W. S. Zeller, Bellefonte, Pa.

PROCEEDINGS

OF THE

THIRTY-THIRD ANNUAL MEETING

OF THE

American Pharmaceutical Association.

REPORT ON THE PROGRESS OF PHARMACY

FROM JULY 1, 1884, to JUNE 30, 1885.

BY C. LEWIS DIEHL.

It seems but a short time since our pleasant reunion in the beautiful "Cream City of the Lakes," yet twelve months have fully passed, and your reporter is again admonished to give an account of the "Progress of Pharmacy" since the date of his last report. There are doubtless some who will maintain that there has been no progress in pharmacy during the past year, nor, for that matter, during a number of years preceding; and in this view the Association would probably join, if "Progress of Pharmacy" could be interpreted to mean the progress made in methods of carrying out the responsible duties of our profession. If, on the other hand, by "Progress of Pharmacy" we understand the development of processes, the discovery of new agents and appliances for the treatment of the sick, the determination of the characters and composition of these agents, and the dissemination of pharmaceutical knowledge in general through the medium of the press, the answer must unqualifiedly be—that the progress made in pharmacy during the past year is perfectly up to the standard, if not in advance, of previous years. As a matter of fact, the number and quality of the papers communicated to the pharmaceutic press during the twelve months past will compare favorably with those abstracted for any previous report, and it is noteworthy that the papers contributed to our American journals, particularly those relating to the histological characters and the proximate constituents of plants, show a very decided improvement over the contributions of previous years. It is believed that the present report very fully represents the papers bearing upon pharmacy that have been communicated, and they have been abstracted with as much brevity as their character seemed to justify.

In conformity with the purpose expressed in last year's report, the reporter has prepared a brief synopsis of the work accomplished by the several State Associations, for this report. He regrets that, as before, he has been compelled to depend mainly upon the current pharmaceutic press for his information, and that, in consequence, the synopsis is again incomplete. Until the Secretaries of the different Associations see fit to give the necessary information, it will be impossible to produce an accurate synopsis of the transactions of their respective Associations, and the reporter would therefore again urge upon these officers to transmit a brief synopsis of the work accomplished as soon as possible after their annual meetings, either to the reporter or to the Permanent Secretary of this Association.

The meetings of the State Pharmaceutical Associations were, as a rule, well attended, and the discussion of subjects of a scientific nature engaged a fair share of attention, though the trade interests, and matters of a merely local character, appear to have been the more popular subjects. From the best sources of information at the command of the reporter, the following brief synopsis—arranged in the order of the States of the meetings—has been compiled:

Michigan State Pharmaceutical Association.—Second annual meeting held at Detroit, September 9th, 10th, and 11th, 1884. Two hundred and twenty-five members in attendance. The following papers were read:

"Why should druggists use the Pharmacopœia?" by A. B. Prescott.

"Sulphates of the cinchona alkaloids. How much water of crystallization do they contain as met with in the market?" by A. B. Lyons, M. D.

"Do preparations of aloes with bicarbonate of potassium or sodium lose medical power in losing their bitterness?" by George McDonald.

"To what extent do the pharmacists of this State register the sale of poisons, and how far are they liable for failure to do so? What articles should be regarded as poisons for registration of sale?" by H. J. Brown.

"Does the phosphoric acid of the market bear the Pharmacopœial tests for strength and purity?" by Hugo Thum.

"Report on the collection of crude drugs from both wild and cultivated plants in Michigan," by F. W. R. Perry.

"Is the new Pharmacopœial process for the preparation of essential waters a satisfactory one?" by L. T. White.

"Is 'Black Antimony' still in use in dispensing pharmacy? If so, what is its character?" by George Gundrum.

"What are the highest percentages practicable for sulphurous acid in watery solutions, what are the corresponding specific gravities, and how can the solution be best preserved?" by Carl Riebe.

"Does the bromide of potassium in use answer the tests of the Pharmacopœia?" by A. L. Green.

"The mustard paper of the Pharmacopœia—is the process a good one, and is it advisable for the dispensing pharmacist to prepare it?" by George McDonald.

"What materials and manipulations are best for the turpentine emulsions?" by George Gundrum.

"How can fluid extract of licorice be used, so as best to cover the taste of quinine?" by Nicholas Vandenbelt.

"What is the morphine strength of the crude and powdered opium in use in this State?" by A. B. Stevens.

"Perfumes, and formulæ for their manufacture?" by Jacob Jesson.

"The specific gravity tables of the U. S. Pharmacopœia of 1880," by A. B. Lyons, M. D.

"Relations of weight to volume in fluids of different specific gravities," by A. B. Lyons, M. D.

"Specific gravity and actual weight of water at various temperatures," by A. B. Lyons, M. D.

The next meeting will be held in Detroit, on the second Tuesday of October, 1885.

Illinois State Pharmaceutical Association.—The fifth annual meeting was held at Bloomington, September 30th, and October 1st and 2d, 1884. The attendance was large. The following papers were read:

"Unofficinal formulæ," by C. S. Hallberg.

"Extract of licorice," by G. H. Grube.

"Fluid extract of hydrastis without alcohol," by H. W. C. Martin.

"Koumiss," by H. W. C. Martin.

"Glucose," by A. E. Ebert.

"Saccharated oxide of iron," by C. S. Hallberg.

The next meeting will be held in Chicago, on the first Tuesday of September, 1885.

New Hampshire State Pharmaceutical Association.—The annual meeting was held in Concord, October 14, 1884. No business of a scientific character appears to have been transacted.

Connecticut State Pharmaceutical Association.—The ninth annual meeting was held at Hartford, February 3 and 4, 1885. The following papers were read:

"Salicylate of Sodium," by C. W. Whittlesey.

"Syrup of Orange," by S. F. Guernsey.

The next meeting will be held at New Haven during February, 1886.

Georgia State Pharmaceutical Association.—The tenth Annual Meeting was held at Atlanta, April 14th and 15th, 1885. The following papers were read:

"What can be done to encourage young men to become better pharmacists?" by G. D. Case.

"What plants indigenous to our State can be gathered or cultivated profitably?" by R. H. Land.

"Whose property is the copy of the prescription after it has been filled?" by J. W. Rankin.

"What is the best and cheapest disinfectant which can be safely used in the sick room?" by Osceola Butler.

"To what extent is it practicable for retail druggists to manufacture their own chemicals?" by Theo. Schumann.

"Chemistry," by R. H. Slack.

The place and date for the next Annual Meeting have not been ascertained.

Alabama State Pharmaceutical Association.—The fourth Annual Meeting was held at Annisten, May 5th and 6th, 1885. The following paper was read:

"Sale and use of Patent Medicines," by M. M. Stone.

The next meeting will be held at Birmingham, on the second Tuesday in May, 1886.

Indiana State Pharmaceutical Association.—The fourth Annual Meeting was held at Indianapolis, May 12th and 13th, 1885. The following papers were read:

"Qualitative Analysis without the direct use of Hydrogen Sulphide," by R. B. Warder.

"Standardizing Pharmaceutical Preparations," by Joseph K. Lilly.

"Trade Interests," by Lucius Lybrand.

"Review of One Thousand Prescriptions," by George W. Sloan.

"Professional and Business Relationship of Pharmacists," by David Hilt.

"Syrups for Soda Water," by L. Eliel.

"The use of Fluid Extracts for making Tinctures, and their value compared with those made according to the Pharmacopœia," by T. S. Motter.

"Pharmacopœial Tests," by J. N. Hurty.

The next meeting will be held at Lafayette, at the call of the Executive Committee.

Iowa State Pharmaceutical Association.—The sixth Annual Meeting was held at Council Bluffs, May 12th, 13th, 14th and 15th, 1885. The following papers were read:

"On the use of phosphoric acid in the place of phosphorus in liquid mixtures," by R. W. Crawford.

"On the addition of glycerin to extracts inclined to become hard," by R. W. Crawford.

"On the use of gelatin capsules for suppositories," by R. W. Crawford.

"Solvent for tartrate of iron and potassium?" by F. E. Houghton.

The next meeting will be held at Des Moines, on the second Wednesday in February, 1886.

Maryland State Pharmaceutical Association.—The third annual meeting was held at Hagerstown, May 12 and 13, 1885. The reporter has been unable to ascertain any particulars of the meeting.

Texas State Pharmaceutical Association.—The sixth annual meeting was held at San Antonio, May 13, 1885. The following papers were read:

"Spirit of Nitrous Ether," by J. W. Graham.

"On the bark of Sambucus Canadensis," by G. S. Richardson.

The next meeting will be held at Dallas, the date to be announced hereafter.

Nebraska State Pharmaceutical Association.—The fourth annual meeting was held at Omaha, May 13 and 14, 1885. The following paper was read:

"On the Syrup of the Phosphates of Calcium, Sodium, Magnesium and Quinine," by Norman A. Kuhn.

The next meeting will be held in Omaha, May 11, 1886.

Virginia State Pharmaceutical Association.—The fourth annual meeting was held at Charlottesville, May 19, 20 and 21, 1885. Several papers were read, but their titles have not been ascertained. The next meeting will be held at Alexandria, May 11, 1886.

Mississippi State Pharmaceutical Association.—The second annual meeting was held at Natchez, May 19, 1885. The following paper was read:

"On Tinting Morphine with a view to Preventing Mistakes," by J. B. Bond, M. D.

The next meeting will be held at Jackson, on the third Tuesday of May, 1886.

Kentucky State Pharmaceutical Association.—The eighth annual meeting was held at Danville, May 20 and 21, 1885. The following papers were read:

"On Tinting Arsenic," by Jefferson Oxley.

"Examination of Quinine Pills of the Trade," by G. A. Zwick.

"Combustibles," by Edward C. Pfingst.

"Adulteration," by H. W. Evans.

"Citrine Ointment," by O. Gier.

The next meeting will be held at Bowling Green, on the first Wednesday of May, 1886.

New Jersey State Pharmaceutical Association.—The fifteenth annual meeting was held at Camden, May 20 and 21, 1885. The following papers were read:

"Infusion of digitalis deposits a sediment on standing a few days. Is this sediment inert? Cannot a process be constructed to avoid this objection, and yield a more permanent preparation?" answered by A. Drescher.

"Simple syrup," by A. Drescher.

"Syrup of tolu," by A. Drescher.

"The education needed for a young man entering the profession of Pharmacy," by A. Drescher.

"Synopsis of Incompatibles," by P. E. Hommell.

"Random Notes," by H. R. Reynolds.

"What standard is it practicable to require for apprentices and students?" by F. B. Kilmer.

"Where lies the Fault?" by P. W. Bedford.

"The Survival of the Fittest," by Dr. Eccles.

The next meeting will be held at Newark, on the third Wednesday of May, 1886.

Ohio State Pharmaceutical Association.—The seventh annual meeting was held at Sandusky, May 20 and 21, 1885. The following papers were read:

"Unguentum Hydrarygri Nitratis," by H. C. Cook.

"Commercial Black Antimony," by S. W. McKeown.

"Commercial Precipitated Sulphur," by S. W. McKeown.

"Commercial Iodine," by Miss H. M. Spenzer.

"Tinctura Opii Deodorata," by Ph. Acker.

"Tinctura Opii Deodorata," by Virgil Coblenz.

"Pills of Nitrate of Silver," by T. Daniels.

"Powdered Capsicum," by S. W. McKeown.

"Commercial Tartaric Acid," by C. M. Reed.

"Baking Powder," by S. W. McKeown.

"Syrup and Tincture of Tolu," by Nathan Rosenwasser.

"Pancreatine as an Emulsifying Agent."

"Volatility of Camphor."

"Fluid Hydrastis."

"Aniline Dyes."

"Commercial Hydrobromic Acid."

"Disinfectants."

"Pill Manufacture."

"Removal of Glass Stoppers."

The next meeting will be held at Springfield, on the first Wednesday of June, 1886.

Louisiana State Pharmaceutical Association.—The third annual meeting was held at New Orleans, May 27 and 28, 1885. The following papers were read :

"On the Best System of Apprenticeship" (three papers).

"On the Microsope."

"On Unofficinal Formulas."

The authors of these several papers have not been ascertained.

The next meeting will be held at New Orleans, on the third Wednesday of April, 1886.

Pennsylvania State Pharmaceutical Association.—The eighth annual meeting was held at Erie, June 2, 3 and 4, 1885. The following papers were read :

"On some Useful Plants of the natural order of Verbenaceæ," by J. M. Maisch.

"Trade Interests," by Wm. L. Turner.

"Sulphuric Acid," by Gustavus Pile.

"Are we Masters of our Profession ?" by S. Henry Stevens.

"Water of Ammonia," by G. W. Kennedy.

"Manufacture of Officinal Preparations," by George W. Stœckel.

"The Desirability of Closer Relationship between the Physician and Apothecary," by L. E. Sayre.

"On the Manufacture of Wines, Syrups, and Tinctures from Fluid Extracts," by Charles T. George.

"Fixed Oil of Ergot," by J. H. Redsecker.

"Orange Flower Water," by J. L. Lemberger.

"Powdered Extracts," by Charles T. George.

"Drug Store Insurance," by M. N. Kline.

"On the Prevention of Accidents by Fire in Drug Stores," by William B. Thompson.

"Phosphorus Pills," by C. F. Randolph.

"Elevating the Standard of Pharmacy," by Andrew Blair.

"Ox Gall," by John F. Patton.

"Salts of Lithium," by John W. Miller.

"How Physicians can Aid in Elevating the Legitimate Profession of Pharmacy," by William B. Thompson.

"Benzoic Acid," by F. H. E. Gleim.

The next meeting will be held at Lebanon, June 8, 1886.

Massachusetts State Pharmaceutical Association.—The fourth annual meeting was held at Pittsfield, June 3 and 4, 1885. The following papers were read :

"On New Chemicals and Pharmaceutical Preparations," by Frank A. Davidson.

"Books and Methods of Study for a Clerk learning Pharmacy, who is unable to attend College," by Edgar L. Patch.

"Many mistakes are made by confounding Morphine with Quinine ;

Would it be practicable to have the salts of Morphine tinted?" by William C. Durkee.

"Have Pharmacists a moral right to sell Opium and its Preparations to those who make a bad use of them?" by William W. Hill.

"A test for Oleomargarin easily applied," by William W. Bartlet.

"Can a Fluid Extract or Tincture of Ginger identical in strength with the U. S. P., be prepared that will not precipitate on the addition of water?" by S. A. D. Sheppard.

"On the Incompatibility of Chloral Hydrate in the presence of Potassium Bromide and Alcohol," by George F. H. Markoe.

"Pharmaceutical Notes," (Kola Nut, Alveloz, Cuprea Bark, Menthol, Coca, Papaine, Canutillo, Rhubarb,) by J. W. Colcord.

The next meeting will be held at Boston, on the first Wednesday of June, 1880.

West Virginia State Pharmaceutical Association.—The fifth Annual Meeting was held at Grafton, June 9, 1885. The next meeting will be held at Wheeling, on the second Tuesday of June, 1886.

Kansas State Pharmaceutical Association.—The sixth Annual Meeting was held at Lawrence, June 10, 1885. The following papers were read:

"On Digestive Ferments," by L. E. Sayre.

"To what extent is the Salicylic Acid of Commerce contaminated with Carbolic Acid?" by H. W. Mehl.

"How does the Commercial Spirit of Nitrous Ether compare with the U. S. Pharmacopœia article in regard to strength and requirements?" by R. H. T. Nesbitt.

"Analysis of Samples of Tincture of Opium found in the Market?" by M. Schott.

"Fungoid Growths in Aqueous Solutions," by R. J. Brown.

The next meeting will be held at Emporia, June 9, 1886.

Missouri State Pharmaceutical Association.—The seventh Annual Meeting was held at Sweet Springs, June 16 and 17, 1885. The following papers were read:

"Testing Quinine Sulphate," by C. O. Curtman.

"How to study Drugs," by O. A. Wall.

"Tinctures by Percolation, or by Maceration," by G. H. C. Klie.

"Miscellaneous Notes," by G. H. C. Klie.

"Non-Officinal Formulas," by J. M. Good.

"Tinted Morphine," by J. B. Bond.

"Syrup of Tolu," by F. G. Kerr.

The next meeting will be held at Sweet Springs, June 15, 1886.

New York Pharmaceutical Association.—The seventh annual meeting was held at Saratoga Springs, June 16, 17 and 18, 1885. The following papers were read:

"Soap Liniment," by W. P. DeForest.

"Botanical Knowledge," by W. P. DeForest.

"Can a Pharmacy Law be satisfactorily carried out without a Renewal of Registration," by Arthur C. Searles.

"What Classes of Merchandise Properly Belong in a Pharmacist's Stock," by Arthur C. Searles.

"Methods of Study for Students," by P. W. Bedford.

"Pharmacopoeia Wines," by P. W. Bedford.

"Indiscriminate Sale of Opium," by T. L. Corwin.

"Elixir Formulas," by S. J. Bendiner.

"Preparation of Medicated Waters," by C. H. Gaus.

"Mechanical Separation in Filtering," by E. S. Dawson, Jr.

"Syrup of Rhubarb," by E. S. Dawson, Jr.

"Spiritus Ætheris Nitrosi," by R. G. Eccles.

"A Comparison of Rock Candy and Sugar Syrups," by Clay W. Holmes.

"National Organization by State Delegations," by George J. Seabury.

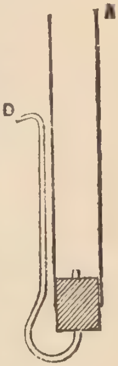
PHARMACY.

A. Apparatus and Manipulations.

SPECIFIC GRAVITY—VOLUMETRY, ETC.

Specific Gravity—Method Applied to Porous Bodies.—Mr. G. Fleury proposes to ascertain the specific gravity of porous substances by measuring the volume of metallic mercury which they displace when immersed in the latter. The specific gravity thus obtained is, of course, only apparent, or that of the body in its unbroken condition. When the substance is powdered, its specific gravity will be quite different. The author uses for the determination a simple apparatus made of a wide and of a narrow glass tube. The substance is to be given an octagonal prismatic shape of the volume of about 10 cubic centimeters, terminating at one end in an octohedral pyramid. The apparatus having been filled with mercury until the latter runs out from the lateral aperture, and all remaining gas-bubbles having been removed by means of a piece of iron wire, the substance is slowly pushed below the surface of the mercury by means of a wire, and the displaced mercury which flows from the lateral aperture caught in a suitable measuring vessel. The temperature of the mercury having been taken account of, the true volume of the same, corresponding to a certain

FIG. I.

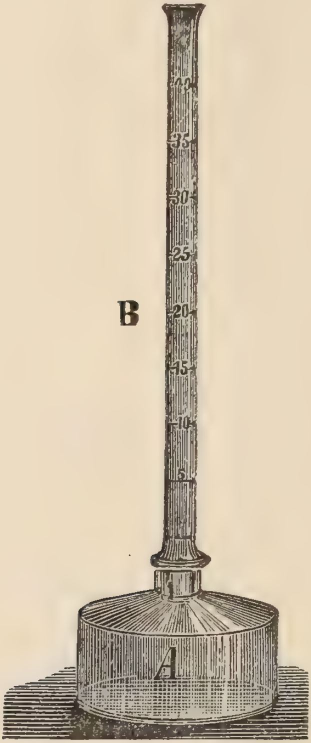


Specific Gravity Apparatus.

temperature, is easily ascertained, and, by dividing the weight of the body by the volume of mercury displaced, the specific gravity of the former is ascertained.—Amer. Drug., Dec. 1884, 237; from Journ. de Pharm., 1884, Oct. p. 255.

Apparatus for Determining the Specific Gravity of Granular and Pulverulent Substances.—Dr. C. Schumann describes an apparatus which is especially intended for ascertaining the specific gravity of granular and powdered substances. A broad, flat-bottomed glass vessel *A* bears ground into its neck a graduate tube *B* of the capacity of 40 c.c., and divided into $\frac{1}{10}$ c.c. For use, the apparatus is filled to the zero mark with a liquid indifferent towards the substance to be examined (water, oil of turpentine, etc.). A weighed portion of the substance is then gradually added through a wide-mouthed funnel, the quantity used varying between 60 and 200 gm., according to its bulkiness. The tube is then closed with a cork, and allowed to stand until the surface layer of liquid is clear enough to read off its position by the lower meniscus. The specific gravity of the substance is found in the usual manner, by dividing the number of grammes of the substance used by the number of cubic centime-

FIG. 2.

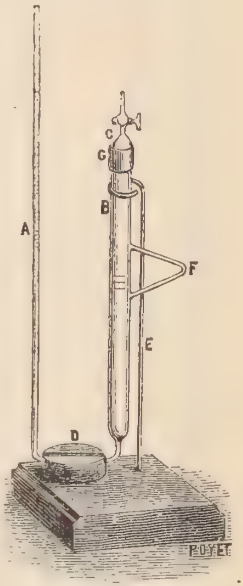


Specific Gravity Apparatus.

ters by which the liquid has risen in the tube. In order to avoid errors arising from differences of temperature, it is only necessary to allow both the substance and the liquid, previous to the experiment, to acquire the temperature of the room, and to take care that this same temperature be maintained throughout the experiment.—Amer. Drug., June 1885, 112; from Chemiker Zeitung.

Specific Gravity Burette.—Messrs. James I. Dobbie and John B. Hutcheson have devised a very handy apparatus for accurately determining the specific gravity of solids, which they call "Specific Gravity Burette," and which is shown by Fig. 3. It consists of a U tube, one of the branches (*A*) of which has a diameter of about 4 millimeters (1/8 inch), while the other (*B*) limb is of wider calibre. A short piece of tube, (*C*) provided with a glass faucet, is connected with *B*, by means of a rubber joint, so that it may be easily taken off or replaced. The apparatus is kept upright by a stout wire and a piece of wood with a notch in which the curve of the U tube rests. Tube *A* is graduated in cubic centimeters, and on a level with the bottom mark on this tube some lines are placed upon the tube *B*, which serve as guide-marks. The apparatus is used in the following manner: At first the tube is filled with a suitable liquid until this reaches to the bottom mark of graduation in tube *A*. Then, having weighed the substance the specific gravity of which is to be determined, this is introduced into the tube *B*, from which the faucet attachment has previously been removed. The level of the liquid will then rise in both branches. The faucet piece *C* is then connected, and the faucet having been opened, air is blown in until the liquid in *B* has been depressed below the guide-marks. The faucet is then closed and carefully reopened to let enough air escape until the level of the liquid is at the mark where it was previous to the introduction of the substance. It is now only necessary to read off the volume displaced by the body, in cubic centimeters. The specific gravity is found by dividing the weight in grammes by the volume of displaced liquid in cubic centimeters, *no matter what liquid may have been employed in the experiment.* In order to facilitate the liquid being brought to the same level again in *B*, Mr. Gray, of Glasgow, has suggested to the authors to connect with the tube a smaller lateral one, in the form of a $>$ (*F*), which is graduated. The level then can be very accurately adjusted. The determinations made with this apparatus have been highly exact and concordant.—Amer. Drug., Sept. 1884, 196; from Philos. Magaz. and La Nature.

FIG. 3.



Specific Gravity Burette.

FIG. 4.

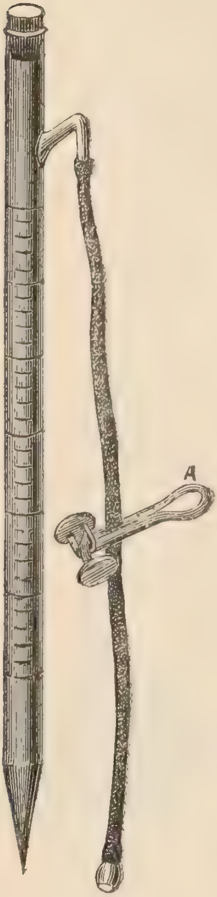
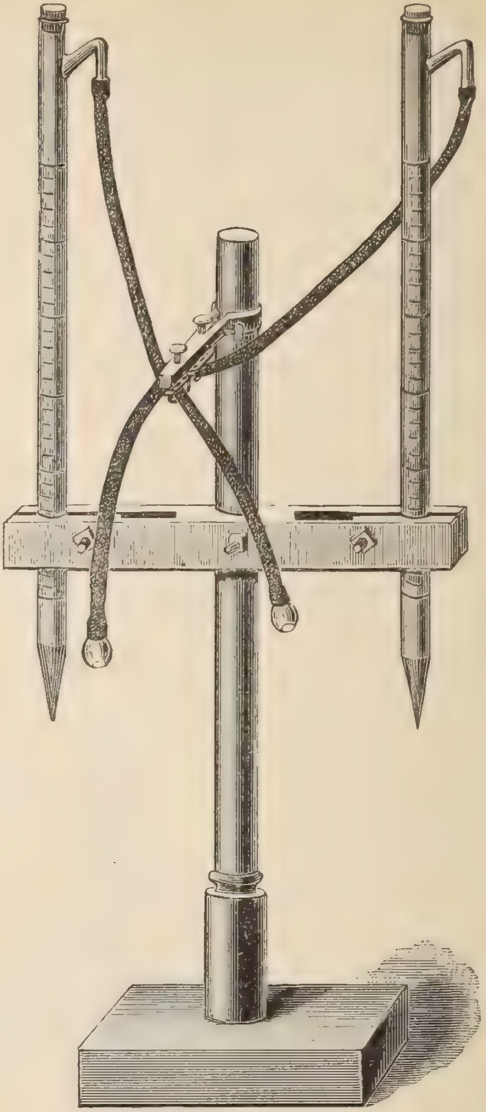


FIG 5.



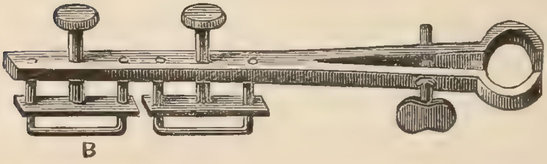
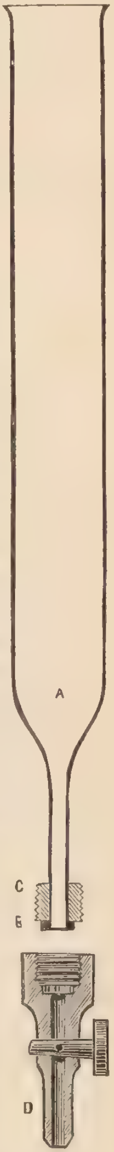


FIG. 6.

(Fig. 4) **Hubner's Pipette-burette with Mohr's Clamp.**
(Fig. 5) **Hubner's Burettes with Vogtherr's Screw-clamp.**
(Fig. 6) **Vogtherr's Double Screw-clamp.**

Burettes—New Construction.—Mr. M. Vogtherr has devised the modified burette shown by Fig. 4. The construction and method of using the burette is shown plainly by the illustration. The titrating solution is drawn from the containing vessel by suction at the mouthpiece of the rubber tube, communication being shut off by the clamp *a*. When two of the burettes are used at the same time, they are placed in the burette stand as shown by Fig. 5, and the respective rubber tubes are passed through a double screw clamp (Fig. 6), which may be attached to the burette stand. The burette cannot be kept filled any length of time, but in all cases sufficiently long to admit of uninterrupted work. Its advantages in some directions are obvious. —Arch. d. Phar., July 1884, 539–547.

FIG. 7.

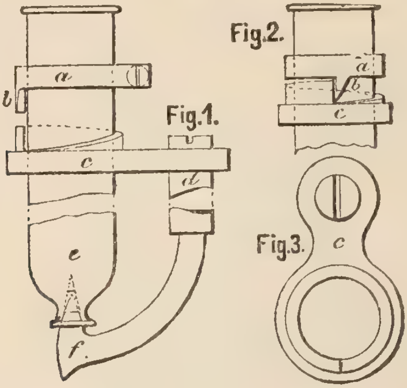


Fiebag's Burette.

Burettes—Construction with a Stop-cock of Tin.—Mr. P. Fiebag draws attention to a construction of burettes which serves a useful purpose in many cases in place of the glass stop-cock usually provided. The construction is shown by the accompanying cut (Fig. 7). The narrow end of the burette is provided with a glass shoulder *b*, upon which are placed the two halves of a ring of tin, fitting closely, and provided with a screw thread *c*. By means of this attachment the burette may be readily screwed upon a stop-cock of tin, as shown at *d*. If necessary a small rubber washer may be interposed. Ibid, 544.

Burette—Improvement.—A novel method of controlling the rate of flow from a burette is shown by Fig. 8, only the upper and lower portions of the burette being shown, and the burette stand being omitted. With the burette-holder is connected a brass rod *d*, which may be raised or lowered at will, and which holds the upper part of the burette by means of a guide plate (1 *c*; also 3, page 38), and at its lower portion is connected with a piece of glass rod the upper point of which fits perfectly true into the lower opening of the burette, the lower point being slightly drawn out to facilitate the dropping of the test-liquid. In the first burettes constructed on this plan, which was originated by John Greiner, of Munich, the upper point of the glass tube, intended to go inside of the orifice of the burette, was made too short (shown by the straight line across); recently the point is made longer, as shown by the dotted lines. A collar *a* is fastened to the burette above the guide plate in such a manner that the projection *b* is in contact (or nearly so) with the plate *c* (see p. 38), and at the same time the glass tube *f* must close the lower orifice hermetically. On now slightly turning the ring *a* holding burette, the point of the projection *b* travels gently upward along the inclined plane of the guide-plate, and the burette thereby becomes slightly raised from its glass stopper *f*, whereupon more or less of the liquid will flow fromit. The inclined plane carried by the guide-plate should ascend, at least in its initial portion, only very gradually, to permit the fine adjustment of the flow of liquid.—Amer. Drug., Mar. 1885, 49.

FIG. 8.



Improved Burette.

Volumetric Analysis.—Mr. L. W. Jassoy has communicated a paper in which he endeavors to show the simplest method of carrying out the different volumetric processes of the Pharm. Germanica. The subject is considered in four sections, viz.: Staturations, Oxydimetry, Iodometry, and Precipitations, and being based on the author's abundant experience, will be consulted with profit by pharmacists, the more particularly so since volumetric estimations, are required by the U. S. Pharmacopœia for estimating the quality of many of its preparations and chemicals.—See Arch. d. Pharm., Aug. 1884, 613-620.

Chemical Analysis—"Drop" Method.—According to Dr. H. Hager, the customary methods for testing medicinal agents, which are both tedious and require a large quantity of material, can be superseded by a method which requires merely single drops of the reagent, as well as of the liquid to be examined. For this method the following reagents are needed:

Red and blue litmus paper and turmeric paper.

Extract of indigo paper, which is turned yellow by hot nitric acid and caustic alkalies, but not by ammonia.

Rosaniline paper as a test for alcohol.

Potassium ferrocyanide paper as a reagent for ferric salts (blue), copper and uranium (deep brown), gold (greenish brown), platinum (brownish green to reddish), thallium and vanadic acid (yellow).

Potassium sulphocyanide paper is turned decidedly yellow by bismuth nitrate, bluish black by salts of copper, red by solution of gold, white by mercuric nitrate, black by mercurous nitrate, and blood-red by ferric salts.

Potassium iodide paper is turned red by mercuric salts, green by mercurous salts, yellow by solution of lead. For detecting chlorates 2 to 3 cc. of the liquid are placed in a small test-tube along with a slip of the paper; 1 cc. of dilute sulphuric acid is then added, and heat is applied. If chlorate is present the liquid turns yellow.

Mercurous nitrate paper serves when moistened to detect ammoniacal gas, which turns it black; caustic alkalies and alkaline mono-carbonates stain it greenish-brown to black, whilst the alkaline bicarbonates leave it colorless.

Silver bichromate paper turns yellow with free hydrochloric acid.

Besides these the author mentions a number of other papers less frequently needed. The use of all consists in letting a drop of the liquid in question fall upon a slip of the paper.

The author tests for arsenic (arsenious and arsenic acids) by means of slips of sheet brass 2.5 to 3 centimetres in length and 15 to 17 centimetres in length. The hydrochloric solution is mixed with a little oxalic acid, or the ammoniacal solution is supersaturated with hydrochloric acid and mixed with oxalic acid in order to reduce arsenic to arsenious acid. A drop of the solution is put upon a brass plate and sharply dried; the place of the drop is then washed with water, when a dark spot of a permanganate color reveals the presence of arsenic. Dark thin outlines still appear in case of dilution with 150,000 parts.

In cases where the papers and the brass plate are not used, the author places the two drops (of the reagent and the liquid in question) near each other upon a slip of glass and mixes them. The transparency of the glass renders the slightest turbidity visible.—Pharmaceut. Central-Halle; Chemiker Zeitung; Chem. News, July 4, 1884, p. 6; Amer. Jour. Phar., August 1884, 416–417.

Analysis by Capillarity.—Referring to Prof. J. U. Lloyd's observation (in connection with his studies of the cause of precipitates in Fluid Extracts—Proceedings 1884, 410–19) that dissolved solids may be completely separated from their solvent by the capillary action of strips of blotting paper; Mr. Hans M. Wilder draws attention to similar observations made by Goppelsroeder, Buliginski, Schoenbein, Frankenheim, Musculus, and others, for which see Amer. Jour. Phar., Oct. 1884, 508–510.

PERCOLATION.

Percolators—Proper Construction.—Professor J. P. Remington, referring to Prof. Oldberg's remarks on percolators at the meeting of the Association in 1884 (in Proceedings, 1884), observes that, when it is considered that the United States Pharmacopœia has been in use nearly two years, and that the papers written by members of the Committee of Revision, which clearly showed the advantage of narrow percolators (see Proceedings 1878–1881,) in making fluid extracts, appeared *several years* before the issue of the Pharmacopœia, it is surprising that so much time should have elapsed before a practical application of the facts there proved should be made. The necessity for percolators of the tall and narrow pattern arises from the increased demand for concentrated preparations like fluid extracts, abstracts, etc. In the case of preparations where the quantity of menstruum is proportionally large, as in the tinctures, wines, etc., ordinary percolators answer perfectly, indeed glass funnels are sometimes in use, and are sometimes preferred; it is evident, however, that if the soluble principles from one hundred parts of a drug are to be extracted by one hundred measures of alcohol, the greater the height of the column of moistened drug in the percolator, in proportion to the mass, the more thorough will be the exhaustion, because if the menstruum is compelled to pass slowly from one particle to *one thousand* immediately below it in a *narrow* percolator, the percolate is much more apt to be saturated than if the menstruum passed slowly from one particle to *one hundred* immediately below it in a *wide* percolator. A series of such percolators, adapted to the quantities of different proportions of drugs, should therefore be ready for use in every well appointed pharmaceutical laboratory.*—Amer. Drug Circ., Oct. 1884, 148.

Apparatus for Continuous Percolation with Boiling Fluids.—Mr. W. Watson Will has for some time used an apparatus for the continuous percolation of such substances as cinchona bark, scammony, etc., which is much simpler in construction than the apparatus hitherto suggested. It consist of the following parts:

1. An ordinary flask, with a long narrow neck, and fitted with a perforated sound cork, or india-rubber stopper.

2. A half-ounce glass syringe, having its lower end stopped by a small plug of cotton wool; the upper end is closed by a perforated cork, through which passes the pointed end of the condensing tube, thus fixing the two tubes firmly together.

3. A long glass tube pointed at one end and having a small hole made near the pointed end, to admit of the inflow of the vapor to be condensed.

4. Another, but wider glass tube, drawn out at one end, so as to admit of a perforated cork, through which passes the upper limb of the con-

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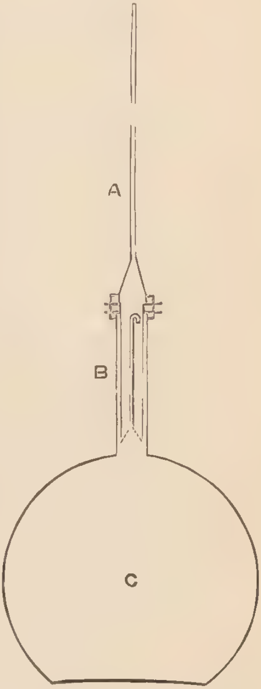
* The dimensions recommended by Professor Oldberg do not in any essential vary from those recommended by the Committee of Revision as given in the Preliminary Notice (p. xxxvi.) to the U. S. Pharmacopœia, 1880, nor with those indicated in his "Second Report on Fluid Extracts" (See Proceedings 1879), by the author of this Report.—Rep.

densing tube. Near the lower end of this tube a small hole is made, into which is fixed a narrow glass tube, to which is attached a piece of india-rubber tubing, and if necessary closed by a clamp.

The working of the apparatus is very simple. Having placed the substance to be exhausted in the tube 2, the condensing tube is now firmly fixed into position and the liquid used for exhausting is poured down the tube. A current of cold water is now allowed to flow into tube 4, this being regulated by means of the clamp. Heat is now applied to the flask, when the vapor passes up and enters tube 3, where it condenses in the upper limb and flows back into the percolator.—Amer. Jour. Phar. 1885, 150; from Phar. Jour. and Trans., Nov. 8, 1884, p. 363.

Apparatus for Continuous Percolation with Boiling Fluids—Construction, etc.—Mr. J. C. Thresh describes the apparatus shown by Fig. 9, which was desired for use in proximate analysis to effect exhaustion with boiling ether or petroleum spirit. The apparatus consists of three parts: *A*, the long condensing tube; *B*, the percolator: and *C*, the flask to contain the solvent, which may be of any desired capacity, but must have a long neck and thickened lip, ground flat on the upper surface. The percolator is a cylindrical tube, a little shorter than the neck of the flask, and in diameter one-eighth to one-fourth inch smaller than the latter. The mouth of the tube bears a thickened flange, ground on both its upper and lower surfaces. The bottom of the tube is pointed and perforated, and drawn out at the centre into a fine tube, curved at the apex, and nearly as long as the percolator. The condenser is simply a long glass tube with conical funnel-shaped mouth, and thickened rim ground on the upper surfaces. A little cotton being placed in the bottom of the percolator, the substance to be exhausted is introduced and packed. Upon this is laid a little cotton (or a disk of filter paper), and finally a thin ring of cork fitting the tube somewhat tightly. A sufficient quantity of menstruum being placed in the flask, a thin ring of cork is pushed down over the percolator, and the latter fitted in the neck of the flask. Another cork disk is laid upon the mouth of the tube, and the funnel of the condenser applied to it, and the whole secured together by a little string or wire. The action of the apparatus is obvious.—Phar. Jour. and Trans., Oct. 1884, 281.

FIG. 9.



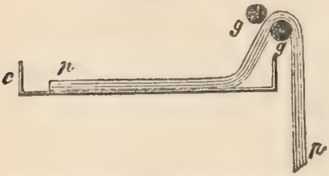
Thresh's Apparatus for Hot Percolation.

Filtration, Precipitation, etc.

Filter Paper—Apparatus for Washing.—Mr. N. Kreussler has devised a convenient arrangement for preparing washed filtering paper, such as is required for analytical purposes.

A flat vessel is filled with diluted hydrochloric acid, and the filtering paper, either in whole packages or sheet after sheet, is laid into it, so that half the paper hangs over the edge of the vessel. The acid is drawn over, by capillary attraction, into the outside portion of the paper, and drops from the lower edge. When the acid ceases to drop, distilled water is poured into the vessel, which will follow the same route as the acid, and gradually wash the paper until the washings cease to have an acid reaction. The arrangement is illustrated by Fig. 10.—Amer. Drug., May 1885, 89; from Zeitsch. f. Anal. Chem., 1885, 81.

Fig. 10.

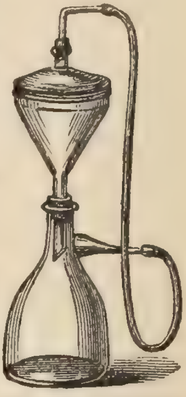


Apparatus for Washing Filter Paper.

Toughened Filter Paper—Preparation, etc.—Mr. E. E. H. Francis describes "toughened filter paper," which he prepares as follows: Filter paper is immersed in nitric acid, sp. gr. 1.42, and to be washed with water. It is then remarkably toughened, the product being pervious to liquids, and quite different to the parchment-paper made by means of sulphuric acid. It can be washed like a piece of linen. So treated it contracts in size, and the ash is diminished, the weight is slightly reduced, and it contains no nitrogen. The toughened paper can be used with the vacuum-pump in ordinary funnels, without extra support, and fits sufficiently close to prevent undue access of air, which is not the case with parchment-paper. An admirable way of preparing filters is also suggested: dip only the apex of the folded paper into nitric acid, and then wash with water; the weak part is thus effectually toughened.—Amer. Drug., May 1885, 97; from Chem. and Drug.

Air-Tight Funnel.—Mr. F. Allihn describes an arrangement, shown by Fig. 11, which he has devised for filtering volatile liquids without incurring loss by evaporation. The cover of the funnel is ground to fit into the latter air-tight, and for the purpose of equalizing the pressure, is connected by means of a rubber tube with a lateral opening in the neck of the bottle, in which the funnel is tightly inserted by means of a perforated cork.—Amer. Drug., Feb. 1885, 27; from Zeitschr. f. Anal. Chem. 1884, 517.

Fig. 11.



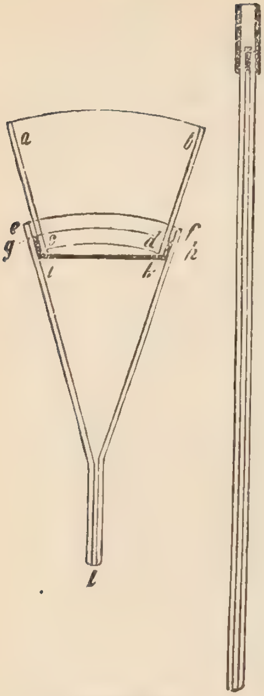
Filtration of Volatile Liquids.

The Editor of the "Amer. Druggist," commenting on the above, observes that he does not consider this arrangement of sufficient advantage to warrant the expenditure for the special apparatus required. A simple glass funnel, with a ground top, covered by a ground glass plate, is all that is needed. In order to establish communication between the air in the funnel and that in the receiver, a piece of glass tubing the lower end of which is ripped open on one side for a short distance (the open side being laid against the side of the funnel) is placed between the funnel and filtering paper. This answers the same purpose.

Filter Pump—Simple Construction.—Mr. William Frear has constructed a filter pump which is very effective and easy in operation beyond all expectation. To the neck of each of two ordinary Winchester quart-bottles are securely fastened loops of stout cord, extending about two or three inches above the stoppers, which are rubber, tightly fitting and doubly perforated. Through each stopper pass two bent tubes, one reaching nearly to the bottom of the bottle, the other cut off just below the stopper. The long tubes in each bottle are connected by a long rubber tube, which need not be very heavy. On the short tube of one of the bottles, which has previously been filled with water, is slipped another rubber tube, connecting the bottle with the filtering flask; both tube and flask must be stout enough to resist the increased external pressure. The loop on the neck of the bottle is now attached to a hook on a cord, which passes over a pulley, fastened to the ceiling, and there is secured by a nail or a hook near the level of the table; by this the bottle is readily raised to any desired height. By suction to the short tube of the other quart bottle, a current is set up from the filtering flask to the elevated bottle, and from there through the long glass tube and rubber tube, the latter acting continuously as a siphon tube. When the water in the elevated bottle has reached the level of the lower end of the long tube, the empty bottle is lowered, and the full quart-bottle is raised; immediately, without any further trouble, the flow begins again. The degree of pressure at the filter can be varied at pleasure by raising or lowering the bottles. With a little practice, and with care to secure air-tight joints, the apparatus will be found very convenient, and serve many useful purposes.—Amer. Drug. Circ., Feb. 1885, 26.

Filtering Apparatus for Syrupy Liquids.—Mr. C. A. Müller describes an improvement on an apparatus previously prepared by him for filtering syrups, which is shown by Fig. 12. It consists of a double funnel, of the angle of 30°, the upper portion of which (*a*, *b*, *c*, *d*,) reaches (and is ground air-tight) some distance into the interior of the funnel itself. The neck of the funnel is lengthened by attaching to it, by means of rubber tubing, a long glass tube of the internal diameter of 0.5 centimeter, into the upper end of which is introduced a thin strip of vulcanized rubber or horn. When the apparatus is to be used, a round filter, having a diameter by 1.5 to 2 cm. larger than the lower aperture of the upper part of the funnel, is soaked for half an hour in

FIG. 12.



Syrup Filter.

distilled water or in the syrup to be filtered. This is then placed over the opening (the funnel being turned up-side down), in such manner that it overlaps the edges uniformly. Over it is placed a piece of gauze of the same size. The funnel itself is then uniformly fitted over it and strongly pressed in. It is then reversed and suspended or placed in a suitable frame. (The black line *t*, *t*,′ shows the position of the paper and gauze.) The extension or suction tube is then attached to the neck of the funnel, and the filtration may be started. The syrup which flows during the filtration through the lower funnel rarefies the air contained in the latter, and thereby increases the pressure of the air upon the liquid in the upper funnel. Hence, during the first five or ten minutes, air-bubbles are carried off, along with the filtrate, through the suction-tube. As soon, however, as the pressure inside and outside of the funnel has become nearly equalized, the rapidity of the flow somewhat diminishes.

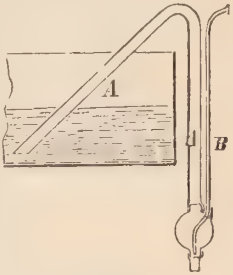
The rate of filtration depends upon the surface of the filter and the length of the suction-tube. The following figures will give an idea of the practical efficiency of the apparatus: With a filter of the diameter of 8.5 cm., containing, therefore, 48 cubic centimeters, and with a suction-tube of 50 cm. (18.9 inches) in length, from 1 to 3 kilos of syrup were filtered per hour, according as the temperature of the latter was nearer 12° or 20° C. Thick viscid syrups filter somewhat more slowly, but always at the rate of over 1 kilo per hour.—Amer. Drug., Feb. 1885, 25; from Arch. d. Phar., 222, 855.

Precipitation.—Dieterich observes that the best way to precipitate is not to pour one solution into the other, but to pour both simultaneously, in a thin stream, into a large quantity of water. The precipitates obtained in this way are not only in an exceedingly fine state, but also easy to wash out and dissolve. If the two solutions differ much in specific gravity, the best way is to let the heavier run in near the top of the water, and the lighter near the bottom. If possible, both solutions ought to be brought to the same bulk.—Amer. Jour. Phar., Jan. 1885, 26, from Pharm. Zeit. Russl., xxiii, p. 371.

Precipitates—Method of Hastening Deposition.—Whittel has found that the addition of a few drops of chloroform causes the immediate deposition of chloride of silver in the liquid in which it has been precipitated. Its influence, of course, is purely mechanical. It may be used to advantage for the same purpose also in other cases.—Amer. Drug. March, 1885, 49.

Siphon—New Form.—Mr. Jaime Puig y Moré has invented a very convenient form of siphon (which is shown by Fig. 13). Into a globe of metal, or, better, of glass, a small tube is introduced through a lateral opening, and the lower end of the tube, drawn out to a point, is made to enter a short distance into the outlet from the globe. The latter is connected with a common siphon of suitable dimensions. By blowing into the small tube, and the rush of air passing down the outlet pipe, the air in the legs of the siphon becomes sufficiently rarefied to cause the liquid to flow on.—Amer. Drug., April 1885, 72.

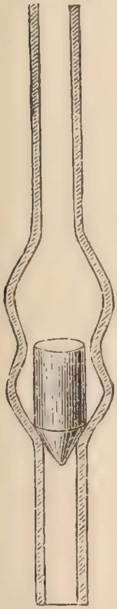
FIG. 13.



Siphon.

Wash Bottles—Improvement.—On blowing into an ordinary wash bottle, the jet issues at first with a considerable violence, not unfrequently causing the loss of a portion of the precipitate or liquid contained in the filter. The cause of this violent squirting is evident, being due to the contraction of the forcibly projected jet by the narrow orifice of the delivery tube. On ceasing to blow, the column of water sinks back, but on again blowing the same troublesome phenomenon recurs.

FIG. 14.



Veat Tube for Wash-Bottles.

The following arrangment easily removes this inconvenience: A portion of the tube, inside of the wash-bottle and dipping into the liquid, is cut off, and a small vent-tube attached to it by a piece of rubber-tubing. The accompanying cut (Fig 14) illustrates this vent-tube. Into its conical portion, a piece of glass rod is ground in air-tight. On blowing, this glass-valve is raised, and only enough water can pass it to deliver a moderate jet. When blowing is discontinued, the valve falls back into its seat and the column of water standing above it is prevented from flowing back. On again blowing, the jet will be delivered without undue force, as before.—Ber. d. Deutsch. Chem. Ges., 1884, 1080; Amer. Drug., October 1884, 188.

Wash Bottles—New Construction.—Mr. J. Habermann has devised a new wash bottle, which is shown in different forms by Figs. 15 and 16. It has this advantage, that it absolutely prevents the retrocession of its liquid contents into the generating vessel, when the pressure in the latter sinks below that of the external air, as is sometimes the case when generating hydrochloric acid, ammoniacal or other gases. Generally, this is prevented by making the tube carrying the gas dip only a very slight distance below the liquid. But in this way the gas never can be properly

FIG. 15.

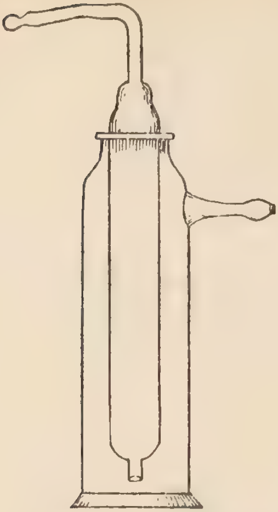
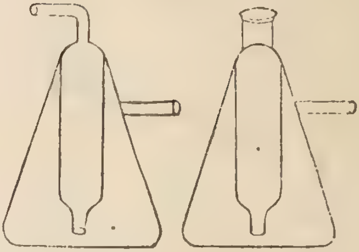


FIG. 16.



Habermann's Wash-Bottle.

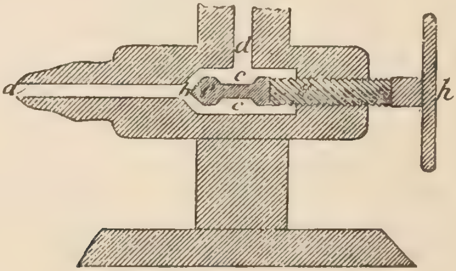
washed. In the new wash-bottle, the gas must pass to the very bottom, and, should the liquid at any time recede, the enlarged portion of the wash-tube is capable of holding the whole of the liquid contents until air can enter below and thus equalize the pressure.

On the same principle, the author has constructed a new absorption-apparatus, such as is used, for instance, in the quantitative determination of ammonia.—Amer. Drug., Mar., 1885, 48; from Chem. Centralbl.

APPLICATION OF HEAT, ETC.

Gas Burner—Improved Construction.—When it is desired to adjust the size of the flame issuing from any of the ordinary gas-burners so as to produce a certain temperature, it is found very difficult to do so, as a delicate adjustment of the ordinary gas stop-cock cannot well be managed by turning it with the hand. J. Halbermann overcomes this defect by employing a burner (Fig. 17), in which the adjustment may be effected

FIG. 17.

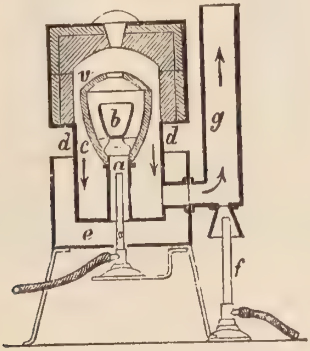


Halbermann's Gas Burner.

by a valve-cock, the stem of which carries a screw-thread. The gas enters at *a*, where a rubber tube connects the burner with the supply pipe, and it issues at *d*. The upper part of the burner may be of any special construction desired.—Amer. Drug., April 1885, 75, from Chem. Centralbl.

Gas Furnace for High Temperatures.—Mr. H. Roessler describes an improved gas furnace, of small size, for producing high temperatures in laboratories. It requires only two ordinary Bunsen burners for producing heat and draught. Its construction is very simple (Fig. 18).

FIG. 18.

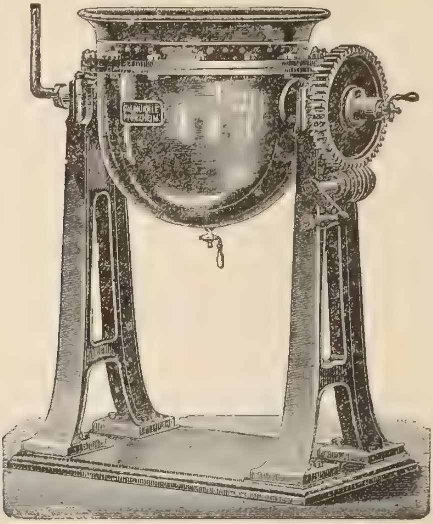


Roessler's Gas Furnace.

The air which supplies the burner enters at *d* and *e*, where it becomes heated before entering the burner and before ascending alongside of the latter. The combustion of the mixed gas and heated air takes place inside of the inclosed space *c*, and the products of combustion escape at *v*, passing down at the outside of the mantle *c*, and thereby utilizing the heat to the utmost extent. A constant draught is produced by the burner *f*, which causes an ascending current through the chimney *g*. This furnace, if well regulated, will melt silver in 15, gold in 20, and a mixture of 90 parts of gold and 10 of platinum in 40 minutes.—Dingl. Polyt. Jour.; Amer. Drug., Sept. 1884, 174.

Steam Kettle—Improved Construction.—Mr. G. J. Muerlle is the inventor of an improved form of steam kettle (which is shown by Fig. 19). Its advantage is that it may be turned by means of an endless screw, worked by a winch, so as to be at any desired angle of inclination, at which angle it remains until the winch is turned again. The steam enters through one of the axles supporting the kettle, and the waste-water either passes out through the other or may be let off from the pet-cock below. A kettle of this construction is, of course, much easier to be emptied of its contents, and to be cleaned. It has a decided advantage over those which have an outlet for the contents at the bottom, although for very large-sized kettles this is probably the only feasible plan.—Amer. Drug., March 1885, 49.

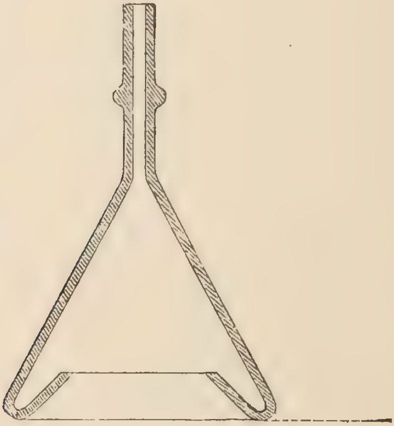
FIG. 19.



Muerlle's Steam Kettle.

Cover for Evaporating Dishes.—Mr. Victor Meyer recommends the use of a funnel with inverted edge (as shown by Fig. 20), for covering evaporating vessels. The vapor of the liquid becomes partly condensed, by coming in contact with the sides of the funnel, and runs down into the gutter formed by the inverted edge. The funnel is occasionally removed

FIG. 20.

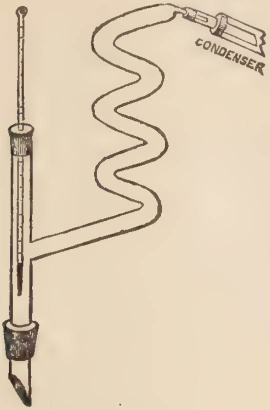


Cover for Evaporating Dishes.

and emptied of liquid.—Amer. Drug. Feb. 1885, 31; from Ber. d. Deutsch. Ges.

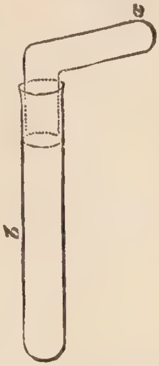
Laboratory Apparatus—Simple Construction.—Mr. Edward Hart describes some simple forms of laboratory apparatus as follows:

FIG. 21.



Fractional Still.

FIG. 22.



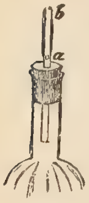
Apparatus for Small Distillations.

Apparatus for Fractional Distillation.—The apparatus has the form shown by Fig. 21. The bent tube, before bending, should be at least two feet long, but may be of any length, with a corresponding number of bends (the greater the length the more perfect the separation), and an internal diameter of at least 3/8 inch. The principle is the familiar one of the "dephlegmator." The condensed portion here runs down, and at each bend passes around the inside of the tube, the vapor passing upward through the ring of descending liquid. A comparison with a Le Bel and Henniger tube, with four bulbs, showed very little difference in the rate of separation. The apparatus is preferable to that of Le Bel and Henniger, by reason of its simplicity and small cost. It can be made by an amateur glass blower, while the former can be made only by a skilled workman.

Retort and Receiver for Small Distillations.—It is often inconvenient to use a retort in making small distillations, chiefly because it takes considerable time to fit up a retort stand. For such small distillations as the preparation of chloro-chromic acid in testing for chlorine, the following arrangement (shown by Fig. 22), is convenient: The retort tube *a* is made by bending a 6-inch test tube. If the tube is heated to redness, and blown into while bending, a neat and strong bend is easily made. In use, the receiver tube *b* is held in the hand, while the retort tube is placed above a small flame. For a retort tube made from a 4-inch test tube, a 6-inch test tube makes a receiver of the proper size. For a 6-inch retort tube, an 8-inch test tube is needed.

A Valve for Allowing Air and Vapor to Escape from a Flask has been used by the author for several years, and has proven perfectly satisfactory. The trouble with the old forms (in one of which a slit is made in the side of a rubber tube, and in the second a piece of rubber is pinned over a hole in a cork, and this slipped over a tube leading from the flask) is, that however carefully they are made, they get out of order very soon, and become a nuisance. In the permanganate test, the liquid in the flask is rapidly heated as soon as the iron wire is introduced, and as soon as the wire is dissolved, boiled to expel all air, and the tube (Fig. 23) pushed down so that the opening *a* in the tube is inside the opening of the rubber cork, which prevents the air from flowing back into the flask as it cools. The tube is closed at *b*. The opening *a* is made either by filing crosswise with a rat-tail file, or, better, by heating with a pointed flame and blowing an opening in the side of the tube.—Amer. Drug. Nov. 1884, 209; from Jour. Amer. Chem. Soc.

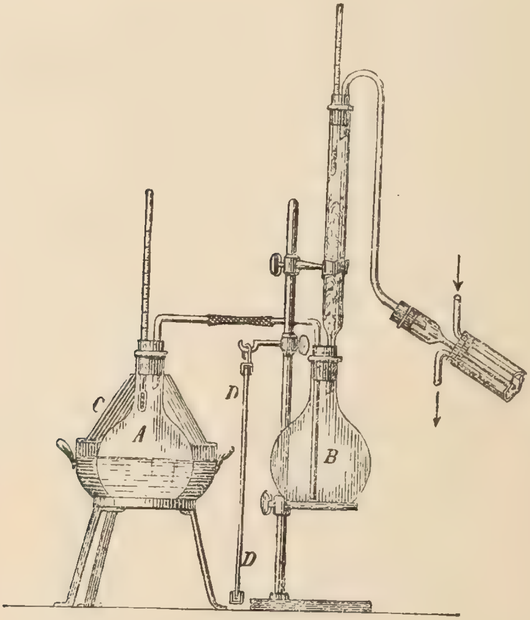
FIG. 23.



Vapor Valve.

Apparatus for Fractional Distillation.—The following arrangement, (shown by Fig. 24), is recommended by Mr. L. Weigert: *A* is a flask of the capacity of three or four pints, in which is contained the liquid which is to be subjected to fractional distillation. This is heated by a water-bath, or a solution of chloride of sodium, or a sand-bath, according to the liquid to

FIG. 24.

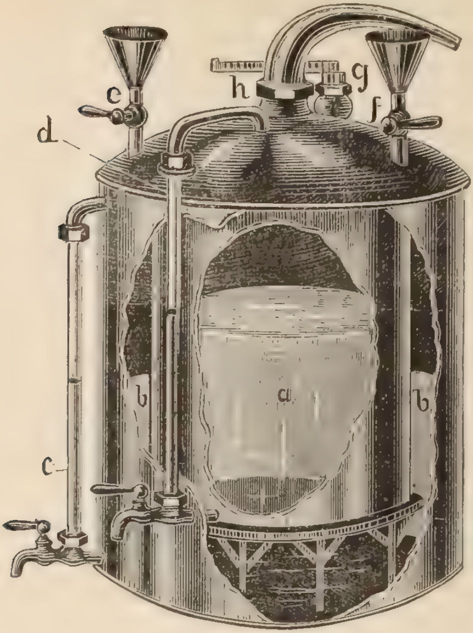


Weigert's Still.

be distilled. *B* is a flask of equal size, upon which is attached (according to Hempel's suggestion) a glass tube filled to three-quarters with pieces or beads of glass, and sixty-five cm. (twenty-five inches) in length. The two flasks are connected by a bent tube, which should not be too narrow and which is best put together from two pieces, joined by rubber-tubing. In order to distribute the heat uniformly, a hood of tinned iron *C*, is inverted over the flask *A*. This hood is provided with hinges and may be opened. It has the additional advantage of preventing the contents of the flask from being scattered about if it should crack or break. Between flasks *A* and *B*, a piece of window-glass *D* (in a frame) is suspended, partly to prevent too much radiation of heat towards flask *B*, and partly also to act as a sort of screen in case the flask *A* should break For the same reason, the two flasks should be at least thirty to thirty-five centimeters (twelve to fourteen inches) apart. The great utility of the apparatus may be judged from the fact that a single distillation is sufficient to almost completely separate alcohol and ether, which is not possible by merely using a Hempel's tube (filled with glass beads). Another advantage is, that when heating alcohol of not over fifty per cent. (which may be done on a sand-bath), a Liebig's condenser is rendered unnecessary; in fact the apparatus is then self-condensing.—Amer. Drug., Dec. 1884, 232; from Zeitsch. Anal. Chem., 23, 365.

Pharmaceutical Still and Vapor Condenser.—Dr. L. Wolff recommends a pharmaceutical still (Fig. 25), and a vapor condenser, which are constructed after his design, but for which he claims no originality—as the most practical devices for the recovery of alcohol in the preparation of fluid extracts. *The still*, as will be seen by the cut, showing both the interior and exterior, is cylindrical. It is about two feet in height, consists of two cylinders, one inside of the other, and both are attached to the convex top; the inner cylinder is mounted on a rest to prevent its weight from dragging down the common top. This inner cylinder contains the menstruum, *a*, to be distilled, or the alcohol to be recovered, which can be introduced at any time through the funnel, *f*. Attached to it from the top and reaching to its bottom is the gauge, *d*, through which the height of its contents, *a*, is seen. At the bottom of the gauge and connected with it is a faucet to draw the contents off at any time. The outer cylinder, which serves both as a joint steam and water-bath, contains water, *b*, connected with the water-gauge, *c*, which indicates the volume contained in it; a faucet attached to the lower end of it serves to draw off the water as needed. Attached to the top of the outer cylinder is a steam valve, *g*, by which, if lifted, the steam may escape without pressure, or, if weighted, may be made to assume any desired pressure. The inner cylinder connects at *h*, by a screw-joint and gum packing, with a bent pipe, which in turn can be attached to a large copper Liebig's condenser.

FIG. 25.



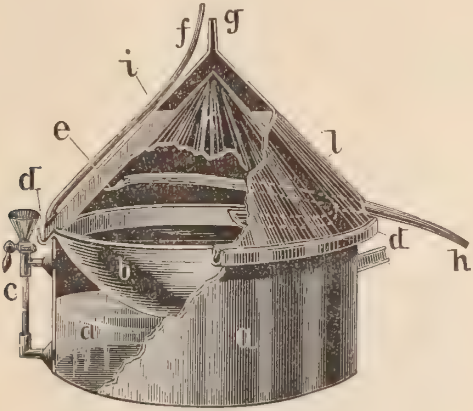
Pharmaceutical Still.

This apparatus is especially useful for recovering the alcohol from dilute menstrua and for concentrating alcohol largely diluted, for purification, as well as for operating with solvents of larger volume, as in the manufacture of resin of podophyllum, berberine and hydrastine, apiol, etc. The solvent in these processes contained in the inner cylinder, and consisting of about five gallons of stronger alcohol, can be recovered in sufficient time to continue percolation with it, making the process almost continuous, and admitting of a twenty or thirty-gallon exhaust to be effected with only about five gallons of menstruum above that absorbed by the substance to be exhausted.

One of the disadvantages of this apparatus is the difficulty of cleansing it after concentrating the liquid to be distilled to a certain degree, and therefore the impossibility of conducting the evaporation to the desired degree. The heating necessary to drive over the vapors, which can only be accomplished at the boiling point of the solvent, is in many cases, especially in aromatic extracts and those containing volatile oils or principles, a great disadvantage; while, if the evaporation is completed in some other flat vessel, considerable loss of the solvent is experienced, which, if alcohol, ether, chloroform, or carbon bisulphide are employed, interferes greatly with the cost of the product.

The most suitable apparatus for recovering all the solvent, and one admitting of rapid evaporation without loss unto dryness of a solid, or the desired density of the residual evaporate of a fluid extract, is the *Hood Vapor Condenser* (Fig. 26), the construction of which is as follows: To

FIG. 26.

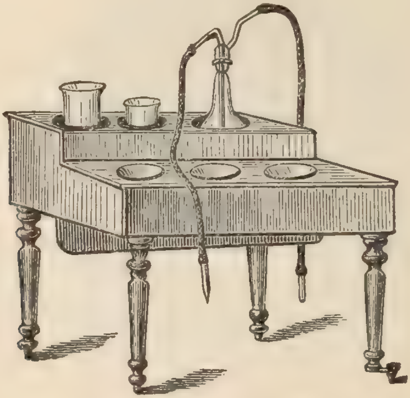


Hood Vapor Condenser.

a water-bath, *a*, containing water, *a'*, fitted with a water-guage, *c*, and faucet to admit turning off to keep the steam, or by turning on to let steam escape, or to add water as needed, and having proper handles to facilitate its removal, is fitted a tinned copper evaporating dish, *b*, as tightly as possible, to prevent the escape of steam at the sides. The evaporating dish has on its sides a groove, *d*, as a receptacle for a flange from the outside cone of the condensing hood. The hood itself is, like the rest of the apparatus, made of light-weight tinned copper, and consists of two cones placed parallel within each other, about one inch apart. The two cones are closed squarely at the bottom, the outer, *l*, projecting and dipping down to form the flange for the water-joint to fit into the groove heretofore mentioned. Running from the top on the outside of the outer cone is a supply pipe, *f*, for cold water, which enters into the space between the two at the bottom of the outside ones. From the top of the outer cone extends a pipe of the same diameter as the former, to admit the escape of the water at *g*. The water for cooling is conducted to *f* by a rubber tube from a hydrant or reservoir, and allowed to flow off by a tube again into a sink. When in operation the vapors arising from the evaporating dish will be condensed on the inner surface of the cone, *k*, and by its slant will run into the gulley, *e*, which is in turn placed slanting into the cone to allow the flowing off of the condensed liquid through the tube *h*. The water-joint, *d*, may be filled with water, but better, according to the solvent to be recovered, with oil or glycerin, and it makes the closure absolute and air-tight, without either the danger of escaping vapor and loss or explosion. The hood can easily be lifted to inspect the contents of the dish, or to replenish the same if necessary, doing away with the screws, flanges, and packing usually employed. To admit of proper operation of the water-joint, however, care must be had to make the escape-pipe, *h*, of the proper diameter, and give it sufficient dip to cause the condensed liquid to flow off readily.—Amer. Jour. Phar., Nov. 1884, 561–567.

Water-Bath and Hot Filter.—Prof. H. Landolt recommends an arrangement shown by Fig. 27. It is in the form of a quadrangular box constructed of sheet copper, the rear portion serving as water-bath, and containing several openings into which flasks, beakers, etc., may be placed, which rest upon a perforated plate elevated over the bottom of the box. The front portion, which is somewhat lower, has three copper funnels soldered into it, destined to hold glass-funnels for hot filtrations. The box stands upon four legs, one of which is provided with a set-screw.—Amer. Drug., May 1885, 89; from Ber. d. Deutsch. Chem. Ges., 1885, 56.

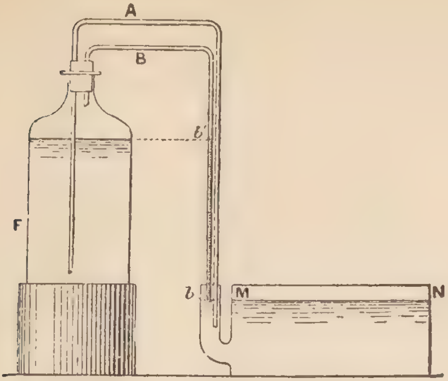
FIG. 27.



Landolt's Water-Bath.

Constant-Level Water-Bath.—The apparatus shown by Fig. 28 is used by Dr. Eugene Mascareñas y Hernandez, for preserving a constant water-level; it is provided with a lateral neck, communicating with the interior of the water-bath, and projecting a short distance horizontally from the bottom of the vessel, before it turns upwards; this avoids the interference of the glass tubes with the edge of any larger-sized capsule placed on the bath. The reservoir for water is a bottle tightly stoppered and through the stopper of which two glass tubes pass bent twice at right angles, one of which terminates just below the stopper, and the outer limb of which ends at the exact level at which the water in the bath is to be kept, while the siphon tube extends to the bottom of the reservoir with one limb, and with the other to some distance down the neck of the

FIG. 28.

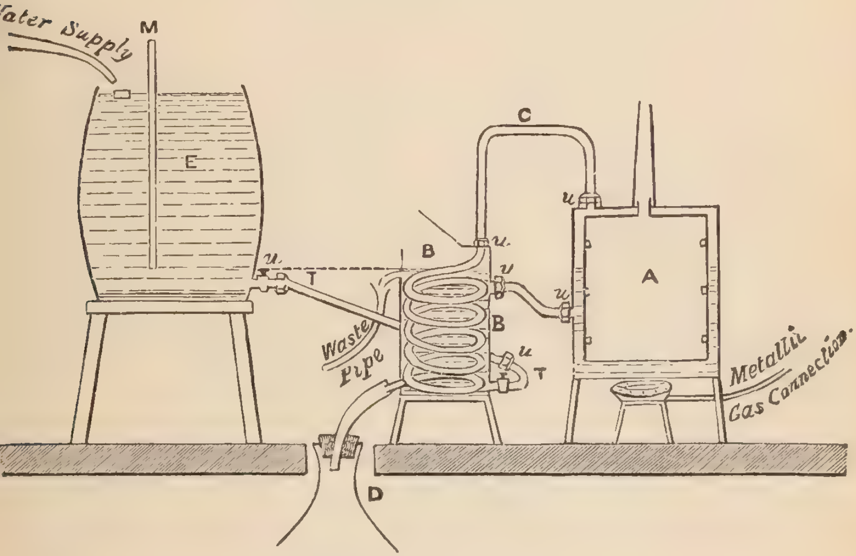


Constant-Level Water-Bath.

water-bath. As soon as the siphon (tube *A*) has been started, the water will flow from the reservoir until the end of the tube *B*, at *b*, becomes closed by the water, when the flow will cease, to begin afresh as soon as the level sinks.—La Nature, Amer. Drug., Sept. 1884, 174.

Constant Level Steam-Oven and Still.—Mr. Alexander J. Atkinson describes a combined steam-oven and distilled water apparatus (Fig. 29), so arranged as to be left to itself for a long period of time without the

Fig. 29.



Atkinson's Steam Oven-Still.

risk of the boiler going dry. The steam-oven *A* is of the ordinary construction, but is fitted at the side with a tube connecting it with the condenser *B*. Heat is applied to the boiler by means of a radial burner, connected with the gas supply by metallic tubing; the steam generated circulates round the drying chamber, escapes through a copper tube *C*, thence through a block tin worm, and falls as distilled water in the receiver *D*. The cistern *E*, fitted with a Mariotte's tube, holds cold water which falls through the tube *TT*, and enters the condenser, where it rises slowly, absorbing heat from the condensing-worm, until it reaches the tube leading to the boiler at a high temperature. For a cistern, an 18-gallon ale cask, supported on a stool, has been found to answer admirably, having the advantage of holding sufficient water on the top to secure the two corks being air-tight. By a suitable adjustment of a Mariotte's tube *M*, the rate of the flow of water can be so regulated that the level of the water in the condenser is constant, or, if desired, allowed to drop slowly into the waste pipe, while the water evaporated from the boiler is replaced by water already near boiling. In practice it has been necessary to allow the water to waste at the rate of about 2 drops a minute, the 18 gallons lasting for over 72 hours, during which time 10 to 11 gallons of distilled water are collected. The several connections are made by union joints at *u u* to allow the apparatus to be taken to pieces and the boiler freed from scale. The whole apparatus may be supported upon a strong shelf, which should be protected from the heat of the burner by means of slates or asbestos mill-board. With this arrangement bulky precipitates may be allowed to remain in the steam-oven all night and found ready for further treatment next morning.—Amer. Drug., Jan. 1885, 6; from Chem. News, Nov. 21, 1884.

MISCELLANEOUS SUBJECTS.

Drug Store Arrangements.—A very interesting series of articles have appeared in "American Druggist," occupying several pages in each number, and running from November 1884 to June 1885, inclusive. The titles of these articles are: "How to make Druggists' Show-Windows Attractive;" "The Artistic Decoration of Drug Store Windows;" "Interior Architecture and Decoration of Drug Stores;" and "The Architecture and Arrangement of Drug Stores." The authors of these papers are Mr. S. H .Bendiner, Prof. J. P. Remington, and (evidently) one of the editors of Amer. Drug. These papers are unsuited for abstraction, and will, therefore, have to be consulted in the original.

Standardizing Pharmaceutical Preparations.—Two papers on this subject were read before the British Pharmaceutical Conference in 1884. In the first, Mr. G. F. Schacht urged that it is the duty of pharmacists to standardize with even some accuracy all preparations that are of known definite composition—and these only; and that we should exert ourselves to extend this class of remedies to the utmost, and to eliminate, as far as possible, all whose composition is unknown or uncertain. The author considers that bodies of definite chemical composition, and their dilutions, are eligible for standardizing; but preparations of the nature of vegetable infusions, tinctures, extracts, being for the most part mixtures of indefinite and unknown agencies, cannot be standardized without risk of misleading. But whenever any of this latter class of bodies has been so studied that the remedial potencies and chemical properties of its elements are declared by authority to be well known, that one passes from the latter class into the former.

In the second paper, Mr. D. B. Dott expresses the opinion that no general system of standardizing pharmaceutical preparations ought to be introduced into the British Pharmacopœia. He points out that it would be impossible to standardize the great majority of preparations, because of the absence of ready and reliable methods of assay, and that, generally speaking, only preparations of those drugs whose active principles are easily isolated can be standardized. The author suggests as an alternative that the alkaloids themselves be employed, but observes that, in nearly every instance, if drugs of sufficient quality were employed, and the process of extraction properly conducted, the necessity for standardizing would not exist.—Yearbook of Phar., 1884, 480–487.

Ether Extractions—Evaporation of Last Trace of Water.—In the evaporation of ether extractions, especially of fatty oils, it is frequently found difficult to get rid of the last traces of water derived from the ether. The drops of water adhering to the bottom of the dish cannot be driven off at a temperature of 100° C., while excess of this temperature is undesirable for fear of loss of oil by spirting. Mr. Gawalovski proposes to overcome this difficulty by using a dish, having the bottom pressed in so as to form a ridge from one side to the other. By a suitable tilting of such a dish, the oil can be caused to run over on one side of this ridge, leaving the water uncovered and free to evaporate.—Zeit. f. Anal. Chem., xxiii., 374; Phar. Jour. and Trans., Dec. 27, 1884, 502.

Weights—East Indian Standards Derived from Seeds.—See *Abrus precatorius*, under Materia Medica.

Laboratory Vessels—Cleansing.—A writer in Dingler's Journal says that flasks which have contained oil or fatty matter may be easily cleansed by a solution of permanganate of potash. Hydrated peroxide of manganese is formed, which, on addition of strong hydrochloric acid, liberates chlorine. This decomposes the organic matter, and allows of washing with water. When the flasks have held resinous solutions, it is necessary to wash with a caustic alkaline lye, and afterwards to rinse with alcohol. To remove turpentine, petroleum, photogene, etc., wash with 30 or 40 grammes of sulphuric acid, and rinse thoroughly in a stream of water.—Amer. Drug., July 1884.

Wooden Vessels—Removal of Unpleasant Taste.—It is suggested that the simplest plan to remove the unpleasant taste from wooden vessels, and one that will succeed in most cases, is to scald them thoroughly several times with boiling water; then dissolve some pearlash or soda in lukewarm water, adding a little lime to it, and wash the inside of the vessels well with the solution. Afterwards scald them again thoroughly several times with boiling water as before.—Amer. Drug., April 1885, 77.

Nickel-Plated Ware—Removal of Tarnish and Rust.—The "Scientific American" recommends that to remove rust from nickel-plated ware without removing the plating, rouge should be applied with a chamois skin. A very little oil may be used with the rouge, and the parts may then be wiped with a slightly oily rag. Another method is to take equal parts of precipitated carbonate of iron and prepared chalk, mix them intimately, apply a small quantity with alcohol, and rub with a chamois skin.—Amer. Drug., Feb. 1885, 35.

Impervious Corks.—It is stated in Polyt. Mittheilungen that corks may be made impervious by soaking them—best quality—for several hours in a solution of ½ oz. of glue or gelatin in a mixture of ¾ oz. of glycerin and 1 pint of water heated to a temperature of about 50° C. (122° F.). Such prepared corks may be rendered nearly proof against acids and other chemicals, if they are dipped, after thorough drying, for ten or fifteen minutes, into a melted mixture of 4 parts of paraffin and 1 part of vaseline.—Amer. Drug., July 1884, 125.

Porcelain-like Label—Method.—Mix thoroughly 1 part of oxide of zinc and 10 parts of solution of silicate of sodium. Put on the bottle three or four coatings, and letter with coal tar diluted with some oil of turpentine.—Rep. Pharm. Chimie, No. 3, 1885, Amer. Jour. Pharm., May 1885, 242.

Cement for Resistance to Heat and Acids.—According to "Chem. Ztg.," this cement consists of 100 parts of sulphur, 2 parts of tallow, 2 parts of rosin, and a certain quantity of finely powdered and sieved glass. The sulphur, tallow and rosin are melted together until the mass has acquired a syrupy consistence with a brown color; enough powdered glass is then added until the mass forms a soft dough. The articles to be cemented must first be warmed, and the cement must be also applied warm.—Amer. Drug., Feb. 1885, 16.

Cement for Mending Mortar and Pestle is, according to "Rundschau" (Leitmeritz), made by melting together equal parts of gutta percha and shellac in an iron vessel on a sand bath. A thin coat of this is applied to the strongly-heated fractured surface, the parts are forcibly pressed together, and allowed to cool in a suitable position.—Amer. Drug., Feb. 1885, 35.

Transparent Cement—Formula.—The following cement is recommended for porcelain: Dissolve 75 gm. caoutchouc in small pieces, in 60 gm. chloroform; add 15 gm, of mastic, and dissolve without heat.—Amer. Jour. Phar., April 1885, 174.

Varnish—Preparation.—A varnish which is equally suitable for paper, metal and wood, is recommended by Campe, to be prepared as follows: Mix 60 parts of bleached shellac, 60 of Manilla copal, 60 of mastic, 15 of Venice turpentine, and 1000 parts of alcohol (92 to 95 per cent.); add a little coarsely-powdered glass, and allow to stand about two weeks, frequently shaking. Then add 1 part of boric acid (which renders the varnish still harder), and filter. The filtered varnish may be colored by alcohol-soluble aniline colors, and in this condition serves as fancy varnish or lacquer for coating bottle caps, tin boxes, etc. The Manilla copal should be powdered, the author having made the observation that copal, after having been powdered and then exposed to the air for some time, is much more rapidly soluble in alcohol. The addition of 1 part of alcohol-soluble aniline orange to 100 parts of the varnish makes a very handsome gold lacquer.—Amer. Drug., Dec. 1884, 235, from Rundschau.

Black Varnish—Formula.—The "Scientific American" gives the following: Dissolve 50 parts of powdered copal in 400 parts of oil of lavender by the aid of a gentle heat, then add 5 parts of lamp-black and 1 part of powdered indigo.—Amer. Drug., Feb. 1885, 35.

B. PREPARATIONS.

ACETA.

Medicated Vinegar.—The following formulas are contributed by Eug. Dieterich:

Acetum Carbolisatum (Carbolic Vinegar).—Mix 5 carbolic acid, 5 Cologne water, and 90 diluted acetic acid. Keep in a cool place for several days and filter.

Acetum Fumale Excelsius (Fumigating Vinegar).—Mix 400 tincture of benzoin, 400 alcohol, 50 acetic ether, 50 essence of jessamine, 100 acetic acid, 10 drops of attar of rose, and 5 drops each of oil of neroli and oil of wintergreen. Keep in a cool place for several days; then filter.

Acetum Stomaticum.—200 compound tincture of spilanthes, 200 spirit of cochlearia (scurvy grass), 100 aromatic tincture, 50 acetic ether, 30 glacial acetic acid, 20 salicylic acid, 400 distilled water, 5 cochineal, 1 oil of sage, 1 oil of peppermint. Mix, warm in a water-bath to 60–70° C.; then keep in a cool place and filter. This vinegar is used as a mouth wash after meals, for which purpose a teaspoonful of it is diluted with about 8 ounces (¼ liter) of water.

Acetum Camphoratum (Camphorated Vinegar).—Dissolve 1 camphor in 19 alcohol; mix with 80 dilute acetic acid. Keep in a cool place for several days and filter.

Acidum Aceticum Aromaticum Excelsius.—Mix 50 oil of bergamot, 50 oil of lemon, 9 oil of ylang ylang, 1 oil of wintergreen, and 89 glacial acetic acid. Keep in a cool place for several days; then filter. It may be colored with eosine or cochineal.

Acidum Aceticum Carbolisatum.—Mix 10 carbolic acid cryst., 85 acetic acid, and 5 oil of eucalyptus. For fumigating the sick chamber, drop upon a hot plate.—Amer. Jour. Phar., May 1885, 239; Pharm. Centralh., 1885.

Antiseptic Vinegar—Formula.—The following formula is recommended in "Der Fortschritt" (No. 2):

℞.	Aetheris acetici	8.0
	Acid. acetic. conc	120.0
	Tinct. eucalypti globuli.	60.0
	Aquæ coloniense	960.0

—Amer. Jour. Phar., April 1885, 173; Pharm. Centralh. 1885, 6.

AQUÆ.

Aquæ Aromaticæ—Extemporaneous Preparation.—Mr. R., in a communication to the "Centralhalle," recommends to dissolve 15 drops of the best quality of essential oil in 4 gm. of alcohol (95 per cent.), and to use 1 drop of such an essence to 10 Gm. of distilled water. Medicated waters prepared with alcohol soon turn sour; therefore a large stock of them should never be kept on hand, but it is more economical and convenient to prepare them extemporaneously as stated. Mr. R. speaks very highly of the orange-flower water prepared with such an essence, and distilled from a glass retort.—Amer. Jour. Pharm., June 1885, 274.

Bitter Almond Water—Preparation.—The usual method of preparing bitter almond water—distillation of a mixture of bitter almond and water over the open fire, after the water has been allowed to act on the powdered almond for ten hours or more—is open to many objections. On the other hand, the distillation by means of steam under ordinary conditions of pressure attainable in pharmaceutical laboratories, is liable to leave a portion of the essential oil in the distilling vessel, and the product will be correspondingly weaker than is required. Mr. J. Mueller, in view of these and other difficulties, proposes the following method: 2.5 kilograms of large Sicilian bitter almonds are powdered, sifted, heated to 30 or 40° C., and subjected to strong pressure to remove the fixed oil. The press-cake is again powdered and made into a thick paste with just sufficient water, 100 cc. of alcohol being finally added. In the meantime the still, provided with a perforated false bottom, is prepared by placing in it a sufficient quantity of water, then placing on the false bottom a layer of clean straw. A layer of the almond paste, in pieces of the size of a nut to that of a small egg, is then placed on the straw, upon this another layer of straw, then another layer of paste, and so on until all the paste has been introduced (the quantity of material being so regulated that the still is then filled completely). 200 cc. of alcohol are now poured on the mass, the still is closed, connected with a condenser, and this with a receiving vessel containing 100 cc. alcohol. Heat is then applied, and distillation, which proceeds rapidly and regularly, even when the source of heat is steam under ordinary pressure, is continued until 2½ kilograms of distillate have been obtained. The distillate is usually one-fifth stronger than required.—Arch. d. Pharm., April 1885, 304–308.

Distilled Water of Wild Cherry Leaves—Preparation and Character.—George E. Spangler collected the leaves of Prunus serotina in the latter part of June, 1833. After macerating 12½ troy ounces of the well bruised leaves with 4½ pints of water, 18 fluid ounces were distilled over, the distillate containing hydrocyanic acid. The leaves collected in July yielded a stronger distillate. It is thought that if the quantity of distillate was made equal in weight to the leaves, the strength of the water would amount to 0.1 per cent. HCy.—Amer. Jour. Phar., Nov. 1884, 570.

Camphor Water—Value as a Preservative for Atropine in Solution, which see under "Alkaloids."

CATAPLASMATA.

Sponge Poultices—Utility.—Dr. Richardson draws attention to the utility of sponge as a poultice carrier, especially for mustard. After the mustard paste has been made of a smooth and even consistency, it should be taken upon a clean sponge, the sponge laid in the centre of a soft white cloth, the corners of which are tied, and the smooth convex side of the sponge is then applied to the surface of the skin. The mustard sponge, warmed again by the fire and slightly moistened, can be applied two or three times, and remains useful for several hours. The sponge can afterwards be cleansed in warm water.—Phar. Jour. and Trans., May 2, 1885, 889; "The Asclepiad," VI., 168.

CERATA ET UNGUENTA.

Benzoinated Ointment and Fats—Proportion of Benzoin to Employ.—Dieterich employs at least 10 per cent. benzoin, although for fats 20 per cent. is better. Only recently rendered fat can be preserved successfully in this way (and all ointments made with it); old and partially rancid fats are not preserved.—Amer. Jour. Phar., Jan. 1885, 26; from Phar. Zeit. Russ. xxiii., 386.

Cold Cream—Improved Formula.—Dr. Unna, the well-known dermatologist, has made a comparative study of the various formulæ proposed in different old and new pharmacopœias and formularies for cold cream, and has come to the conclusion that, so far as appearance, consistence, cooling effect, etc., etc., were concerned, the following formula is the most suitable for dermatological purposes:

Rose-water	10 parts.
Expressed oil of almonds	10 parts.
White wax	1 part.
Spermaceti	1 part.

Misce sec. art.—Amer. Drug., Dec. 1884, 228; from Phar. Centralbl.

Camphor Ice—Formula.—The following is recommended by Mr. T. H. Hazard:—

Wax	16 oz.
Spermaceti	16 oz.
Oil of sweet almonds	16 fl. oz.
Glycerin	½ fl. oz.
Camphor	3 oz.

Misce, sec. art.—Amer. Drug., Feb. 1885, 35; from Weekly Drug News.

Ointment of Salicylic Acid—Preparation.—Mr. Balmanno Squire recommends that salicylic acid be dissolved in the hot lard and the solution constantly stirred while cooling, so that the salicylic acid may separate in a minutely divided condition and be uniformly distributed. The author lays stress on the importance of minute division of the substance incorporated with fats for topical use, and draws attention to several ointments —yellow oxide of mercury, chrysophanic acid, etc.—in which the value of this minute division is now generally recognized.—Amer. Jour. Phar., Nov. 1884, 594–596; from Phar. Jour. and Trans., Oct. 1884, 281.

Unguentum Hydrargyri—Presence of Oxides, etc.—In *Mercurial Preparations* under "Inorganic Chemistry."

Mercurial Ointment—Substitute.—Mr. Vomacka gives the following directions for the preparation of a substitute for mercurial ointment: One part of soft soap is mixed with a little glycerin in a glass mortar, and one part of mercury is added with constant trituration. When no globules of mercury are any longer visible, add two parts more of potash soap to make four parts. It may be scented with lavender or other essential oil. —Amer. Jour. Phar., Sept. 1884, 492; from Med. and Surg. Rep.

Cerate of Subacetate of Lead—Modified Formula.—Mr. Ed. F. Baum recommends the following as essentially replacing the officinal formula, the introduction of camphor being in his opinion not necessary: Liquor Plumbi Subacet., 90 ♏; ceratum, 370 gr.; glycerinum, 20 ♏. Mix. —Amer. Drug Circ. September 1884, 130.

Ointment of Lead Nitrate—Formula.—For old ulcers of the leg, Professor Bartholow recommends blistering the surface of the ulcer and the adjoining integument, then putting on a light poultice, and afterwards applying an ointment composed of: R. Plumbi nitratis, ʒ i; vaseline, ℥ i. —Amer. Jour. Phar. May 1885, 267; Medical Herald.

CHARTA.

Mustard Paper—Objections to the Officinal Process.—Mr. George McDonald, in a paper read at the meeting of the Michigan Pharmaceutical Association, states that the formula given by the Pharmacopœia does not seem to work well, since the mixture of powdered mustard (deprived of oil) and of solution of gutta-percha cannot be applied to the paper with a *brush*. He finds that the mass follows the brush and refuses to adhere to the paper. If, however, a common 8-inch spatula be used for applying the mass, a tolerable degree of success is obtained. He also draws attention to the different features otherwise presented by the article as put on the market by manufacturers, and that made by the officinal formula. The commercial article is on *soft*, unsized paper, and, therefore, soft and pliable, while the officinal is on stiff and sized paper. When the latter is dipped into water it does not retain enough moisture to produce the "oil of mustard" rapidly enough, while the soft, unsized paper certainly has this advantage.

The author also tried other solvents than that recommended by the Pharmacopœia for mixing with the powdered mustard, and obtained better results from a solution of one drachm of gutta-percha in ten fluiddrachms of coal-tar benzol, than from any other.—Amer. Drug., Jan. 1884, 5; from "The Druggist."

CONFECTIONES.

Chocolate—Percentage of Fat Present in Commercial Branas.—Mr. J. H. Hagenbuch, after remarking on the manner commonly pursued in the preparation of chocolate, observes that it is claimed that the expression of the oil from the seed, before conversion into chocolate, has the advantage of making the confection more easily digestible, and the active constituents remain in the main unimpaired. He has determined the fats and other components in various brands of chocolate, with the following results: From B's chocolate was obtained the greatest amount of fatty matter, it containing 45.8 per cent., which fused at 36° C. (96° F.), this being near the fusing point of pure cacao butter. It contains twenty-eight per cent. of sugar, some starch, and 3.1 per cent. of ash.

C. and A.'s contained 35½ per cent. of fat, which fused at 38° C. (100° F.), this being about 5° F. higher than the melting point of cacao butter; sugar, starch, a substance insoluble in cold or hot water, or hydrochloric acid, and 2.75 per cent. of ash were found.

E.'s cocoa contained thirty-eight per cent. of fat, which fused at 37° C. (98° F.); sugar nearly forty per cent., starch eighteen per cent., and an insoluble substance. The ash was 2.3 per cent.

W.'s plain commercial chocolate contained 26.5 per cent. of fat, which fused at 36° C. (96° F.); sugar forty-five per cent., starch, and 2.2 per cent. ash.

W.'s sweet chocolate had but twelve per cent. of fat, and this fused at 38° C. (100° F.), nearly sixty per cent. of sugar, and 1.7 per cent. of ash.

A. and M.'s brand "A" contained twenty-six per cent. of fat, sugar. starch, and a quantity of coloring matter.

A. and M.'s powdered chocolate contained fourteen per cent. of fatty matter, which fused at 39° C. (102° F.), sugar, and 4.4 per cent. of ash. —Amer. Jour. Phar., June 1885, 276–278.

Noyaû.—Original source stated to be the leaves of *Ipomœa sinuata*, which see under "Materia Medica."

ELIXIRS.

Elixir of Pepsin—Formula.—Mr. P. Vigier, the author of the "Elixir de Pepsin" of the first edition of the new French Codex, explains why he does not prescribe any aromatic. He states that a liquid containing less than 12% of alcohol does not keep well, whilst if it contains over 18% a good deal of pepsin is precipitated. His aim was, therefore, to obtain a liquid of between 12 and 15% alcoholic strength, which might subsequently be flavored to suit. He suggests rum, kirschwasser, or vanilla, as good flavoring ingredients, a good formula being the following: Pepsin (pure), 20 parts; distilled water, 355 parts; syrup, 400 parts; rum (45% alcohol), 265 parts. This elixir contains about 15% alcohol if the amount of sugar is deducted.

During these experiments, Mr. Vigier says thas he has noticed that all pepsins are not equally adapted for making alcoholic solutions. Amylaceous pepsin [such as Boudault's] produce very good solutions of this kind, according to the author. English pepsins obtained by scraping the mucous membrane of the stomach are almost insoluble, and produce very unsatisfactory solutions. Saccharated pepsins, prepared by precipitating the ferment with common salt and subsequent admixture of sugar of milk, though they are very soluble, *yield only very feeble alcoholic solutions*, which is probably due to the fact that the pepsin is still mixed with some common salt.

But there are also some pure ("extractive") pepsins which yield alcoholic solutions of feeble power. Hence it is *always* necessary to assay the product by making an artificial digestion.

Glycerin, which has been vaunted as an excellent solvent and preservative of pepsin, is not recommended by Mr. Vigier, who says that it produces feebly-active solutions.

It has been proposed to add diastase (ptyalin) and pancreatin to liquid preparations of pepsin; but this combination is altogether irrational. Hydrochloric acid has likewise been much recommended as an addition to bring out the digestive power of pepsin; yet this is not at all necessary, as it does not suit every case, and does *not* augment the digestive power, as the author states he has ascertained by numerous experiments.

In assaying alcoholic preparations of pepsin, the latter must be diluted with water, since without the latter they do not dissolve any fibrin. It is best to add 3 parts of acidulated water to every 1 part of wine or elixir of pepsin.—Amer. Drug., Oct. 1884, 189.

Elixirs Containing Acetate of Magnesium.—Mr. A. F. W. Neynaber, Sr., recommends the following formulas for preparing efficient laxative elixirs:

Elixir Cathartic.—Calcined magnesia, 240 grains; acetic acid, a sufficient quantity; fluid extract of Culver's root, ½ fluidounce; fluid extract of butternut bark, ½ fluidounce; fluid extract of Alexandria senna, 2 fluidounces; flavor, a sufficient quantity; simple syrup, 4 fluidounces; deodorized alcohol, 4 fluidounces; citric acid, 40 to 60 grains; water, sufficient to make one pint.

Elixir Laxans (Laxative Elixir, mild).—Calcined magnesia, 120 grains; acetic acid, a sufficient quantity; fluid extract of Alexandria senna, 2 fluidounces; fluid extract of coriander, 2 fluidrachms; deodorized alcohol, 1 fluidounce; simple syrup, 4 fluidounces; citric acid, 30 to 60 grains; water, sufficient to make 1 pint.

Elixir of Rhubarb and Magnesia.—Rhubarb, 10 grains; magnesia, 5 grains, to the tablespoonful dose.

Calcined magnesia, 1,280 grains; acetic acid, a sufficient quantity; fluid extract of rhubarb, 5 fluidounces and 2⅔ fluidrachms; deodorized alcohol, 2 pints; simple syrup, 2 pints; flavor, to suit taste; water sufficient to make 1 gallon.

If desired, citric acid can be added, say about 30 to 60 grains, according to taste.—Amer. Jour. Pharm., Sept. 1884, 471–472.

EXTRACTA.

Extraction of Vegetable Substances under Pressure.—Dr. O. Kohlrausch obtains very concentrated solutions of vegetable substances as follows: The material to be extracted is covered with water, and macerated for some time at a pressure of one atmosphere. The water penetrates the cellular tissue, dissolves the coloring matter, and, by way of diffusion, the water becomes saturated to the same degree as the liquid in the cells. Separating the liquid, and repeating the operation several times, under the same conditions, secures the complete extraction of coloring matter. —Amer. Jour. Pharm., April 1885, 170; from Erfindungen und Erfahrungen, Wien. i., 1885.

Extracts.—Removal of *Copper*, which see under "Inorganic Chemistry."

Extract of Cannabis Indica—Cause of Green Color.—Mr. Henry Maclagan finds that when extract of cannabis indica is made according to the U. S. P. process, the green percolate being evaporated in a porcelain vessel, the resulting extract will not have a green color, but will be *brownish black.* Even when the green tincture is evaporated spontaneously, the resulting extract will be brownish black. After repeated experiments, the author determined to search for copper as the cause of the bright-green color of the imported extracts, and this he found to be present in *all* of the imported extracts, in one case to the amount of ⅕ of 1 %. Some carefully selected cannabis tops were then exhausted with alcohol sp. g. 0.820, one-half of the percolate being evaporated in a copper vessel and the other in porcelain; the extract from the latter was brownish-black, while that from the copper had the usual rich green hue. A singular feature of the case is that, while the *original* percolate was of a bright green color, a tincture made from the "porcelain" extracts is *brown*, which indicates clearly that some principle is lost or altered in the process. Upon gently heating for a little time some of the black extract with finely-divided copper, the color quickly changes to green, and a considerable portion (about seven per cent) of the extract becomes insoluble in alcohol, but is readily soluble in chloroform. Both solutions yield green extracts, that from the chloroform being hard and brittle. Analysis of the portion soluble in alcohol showed ⅛ of 1 % of Cu, while the other showed the large amount of 8½ %, and he thinks it is very probable that prolonged contact with the copper would convert the whole of the extract into the latter compound. The quantity of metal in the two combined was about ⅔ of 1 %. The author is satisfied that the true color of extract of cannabis indica, made from the flowering tops, as directed by the U. S. P., is brownish-black, and that it cannot be of a green color without being contaminated with copper.— Amer. Drug., July 1884, 121.

Dr. E. R. Squibb, referring to Mr. Maclagan's observation that the green color of extract of cannabis indica is due to the presence of copper, maintains that a properly prepared extract from well preserved green hemp tops has always a green color, and that this color is due to unaltered chlorophyll and not necessarily to copper. The author admits the presence of traces of copper in some of the extract made in his laboratory; but this quantity is so small that it can be safely disregarded, (1:3700 or .027%), and the quantity introduced into the system with each medium dose of 2 grains of extract (.00074 grains) is probably exceeded in the food of every meal of every-day life. "Ephemeris," vol. 11, No. 5, 647--653.

Mr. Maclagan, in rejoinder, observes that it was not his intention to convey the idea that copper was present in harmful quantities. Nevertheless he maintains that the quantity even in Dr. Squibb's extract is larger than that admitted by that author. He, furthermore, contends that the bright green color of extract of cannabis indica, is due to the formation of a compound with the copper, and gives experimental data in support of his view.—Amer. Drug., Jan. 1885, 3–4.

Extract of Calabar Bean—Characters when Prepared with Different Menstrua.—Mr. Adam Gibson, having noticed that the physical character of extract of Calabar bean varied considerably, has prepared the extract by the officinal (B. P.) process, and several modifications thereof, and subjected the products to examination. Four extracts were prepared with the following menstruum, four ounces of Calabar bean being used for each.

A, with rectified spirits (B. P. process).

B, with 66% alcohol.

C, with 58% alcohol.

D, with proof spirits.

The results were as follows:

A. Yield of extract, 1.32 per cent. Character: pale brown, homogeneous, viscid, somewhat fatty to the feeling. It yielded to water 30.76 per cent. of its weight, and contained 5 per cent. of alkaloid.

B. Yield of extract, 4.56 per cent. Character: similar to *A*, slightly sticky when rubbed between the fingers. It yielded to water 57.14 per per cent. of its weight, and contained 2.6 per cent. of alkaloid.

C. Yield of extract, 6.62 per cent. Character: brown, homogeneous and stringy. It yielded to water 80 per cent. of its weight, and contained 1 8 per cent of alkaloid.

D. Yield of extract, 9.44 per cent. Character: dark brown, with black patches of resinous matter intermixed. More marked stringiness than in extract *C*. It yielded to water 86.4 per cent. of its weight, and contained 1.2 per cent. of alkaloid.

It is scarcely possible to distinguish between *A* and *B*, but these are distinguished from *C* and *D* by the total absence of any stringy character. This characteristic may be useful as a rough indication of quality.

If it were found that extract *B* contained sufficient alkaloid for therapeutical purposes, the compilers of the Pharmacopœia might consider whether they should not allow it to take the place of the present extract; but apart from this, it is worthy of note that 66 per cent. alcohol is of all alcoholic menstrua the best suited for the full extraction of the alkaloid, while those of a lower percentage appear to be inadmissible on account of the large quantity of extractive matter dissolved by them.—Amer. Jour. Phar., April 1885, 192–196; from Phar. Jour. and Trans., Jan. 24, 1885, 593.

Extract of Calabar Bean—Commercial Quality.—Referring to the above paper, Mr. Peter MacEwan observes that Mr. Gibson's results make it evident that a slight variation in the alcoholic strength of the menstruum used in the preparation of this extract may cause considerable difference in its character and alkaloidal strength, and some difference may also arise from variation in the quality of the drug. In order to ascertain how far this is the case with the extracts at present supplied to the pharmacist, he has obtained eight samples from well-known wholesale houses and dispensing establishments, and has subjected them to the method of examination adopted by Mr. Gibson, with the results shown in the table. It is necessary to mention that by "extractive" is meant the portion of the extract dissolved by water.

Extract No. 1.	Taken	0.525	gram,	which yielded
	Extractive	0.27	“	= 51.42 per cent.
	Alkaloid	0.055	“	= 10.47 “
“ No. 2.	Taken	0.53	“	which yielded
	Extractive	0.195	“	= 36.79 per cent.
	Alkaloid	0.03	“	= 5.66 “
“ No. 3.	Taken	0.55	“	which yielded
	Extractive	0.3	“	= 54.54 per cent.
	Alkaloid	0.03	“	= 5.45 “
“ No. 4.	Taken	0.38	“	which yielded
	Extractive	0.135	“	= 35.52 per cent.
	Alkaloid	0.015	“	= 3.94 “
“ No. 5.	Taken	0.155	“	which yielded
	Extractive	0.07	“	= 45.15 per cent.
	Alkaloid	0.006	“	= 3.87 “
“ No. 6.	Taken	0.45	“	which yielded
	Extractive	0.315	“	= 70 per cent.
	Alkaloid	0.08	“	= 6.6 “
“ No. 7.	Taken	0.5	“	which yielded
	Extractive	0.255	“	= 52 per cent.
	Alkaloid	0.008	“	= 1.6 “
“ No. 8.	Taken	0.54	“	which yielded
	Extractive	0.42	“	= 77.7 per cent.
	Alkaloid	0.006	“	= 1.1 “

The most noteworthy feature about these figures is the indication which they afford of the extensive variety at the disposal of the pharmacist.

The extracts differed considerably in consistence, but their color was the same, a brown-black and not the pale brown noted by Mr. Gibson. The author presumes that the darker color is an unadvoidable consequence of manufacture on the large scale. Extract No. 1 was quite granular, minute black granules being imbedded in a brown fatty extract. This extract was further peculiar in the naphtha odor which it possessed, the residuum evidently of methylated spirit used in its manufacture. From Nos. 2, 3 and 5, a film of oil exuded on standing. This separation of oil is not inconsistent with careful manufacture, because the bean contains oil, which is extracted by the proper menstruum. No. 5 was semiliquid when received. Nos. 6, 7 and 8 were easily miscible with water; the others were not.

The high alkaloidal content of Nos. 1 and 6 gives these extracts peculiar prominence, and points either to great difference in the strength of the bean or the use of another variety of greater strength. It is most unlikely that an occasional extract of true Calabar bean should show double the alkaloid that it usually does; but from a remark by Mr. Holmes on the seed of *Physostigma cylindrospermum*, it is more likely that extracts prepared from the cylindrical bean would show such a quantity. If this surmise be correct, the use of this bean cannot be too strongly deprecated, because it is as dangerous to have preparations of too great potency as it is to have them worthless.—Amer. Jour. Phar., April 1886, 196–199; Phar. Jour. Tran., Jan. 24, 1885, 594.

Ergotin—Preparation of Permanent Solution.—According to Bonjean, a very durable solution of ergotin, suitable for hypodermic use, may be obtained by dissolving 1 part of his ergotin in 7 parts of cherry-laurel water (Pharm. Fr., containing 1 part of hydrocyanic acid in 2,000 parts) at as low a temperature as possible, allowing it to stand five days, and filtering without shaking up the sediment. The filtrate is to be digested during twenty-four hours with a quantity of animal charcoal equal to that of the original ergotin, and then again filtered. The resulting liquid has an amber color, and corresponds to about an equal weight of ergot.—L'Union Pharm., Amer. Drug., July 1884, 134.

Extract of Malt—Method of Analysis.—Objection having been found to his method for the analysis of Extract of Malt (see Proceedings 1883, 54), on the ground that the determination of diastase was not sufficently precise, Mr. Carl Jungk observes that the method was intended as a rapid means of arriving at the value of a malt extract by persons not experienced in analytical work, and for this it serves a good purpose. He now communicates a precise method for the use of experienced analysts, which will be found in Amer. Jour. Phar.; Jan. 1885, 13–20.

Extract of Malt—Determination of Value.—Mr. H. Tiesler has examined eight samples of extract of malt by Jungk's method (see Proceedings 1883, 54), for determining the diastatic value. In order to avoid the possible liquefying action upon starch of the free acid present, this was neutralized with baryta water. Five of the samples contained no diastase, the remaining three variable proportions of the same. The rapidity with which the malt extracts liquefied starch paste was estimated by means of a flat vessel having on the bottom a short thin discharge pipe through which in one minute 46.56 ccm. of distilled water of 15° C. would run off. The mixtures of malt extract and starch were digested for a certain length of time, then rapidly cooled to 15° C. and carefully strained, when one sample discharged after one minute's action 44.57 ccm., and after 12 hours' 45.37 ccm., while the other sample discharged only 37·01 and 40·89 ccm. respectively.

The author advises also the concentration of malt extract, so that it contain not less than 80 per cent. of dry matter. In dilute solutions the diastatic power is more or less rapidly decreased.—Amer. Jour. Phar. Nov. 1884, 593, from Phar. Zeitschr. f. Russl., pp. 297–301.

Extract of Male Fern—Preparation of an Active Article.—According to Kramer a very active extract of male fern may be prepared by exhausting with ether the fresh juicy rhizomes collected in May or October freed from scales and cut into small pieces. The ethereal tincture should be kept in a cool place until wanted, when the necessary quantity should be converted into extract. One dose, ten to fifteen grams of such an extract, is said to have always produced satisfactory results —Phar. Jour. and Trans., Feb. 28, 1885, 693 ; Pharm. Centralh., xxv., 578.

Hop Extract—Comparative Examination of Two Preparations.—Mr. Wayne B. Bissell draws attention to a new kind of *hop extract* which is prepared, under a patent, by a new process, and is largely and satisfactorily used in the manufacture of beer. Without going into the details of the process by which this patent extract is obtained, it may be stated that it is produced by the combined action of steam under pressure and gasoline, the extract settling in the aqueous fluid in the extraction, whilst the gasoline rises to the surface, and, after cooling, is used for a fresh portion of hops. The extract so obtained is black, oily, free from tannin, and contains about 16 per cent. of glucose. Small white crystals are frequently seen in it, which, however, it is almost impossible to separate. On heating this extract at 100° C. until it ceased to lose weight, this loss was quite insignificant, amounting only to 0.05 per cent., and a farther loss of 0.03 per cent. took place at 110° C. No change of either color, odor or consistence resulted from this treatment. It is practically insoluble in water, cold or hot, and cold alcohol ; but hot alcohol or benzin readily holds it in extraction.

For comparison, the author prepared an extract by extracting a fine sample of late hops, which appeared rich in lupulin, thoroughly with alcohol by percolation. The drug was then boiled in water for one hour, strained and washed. The alcoholic and watery extracts were evaporated at a very low temperature to a thick syrup and then mixed, and further evaporation carried on by means of a water bath until a product of nearly pilular consistence was obtained, in which condition the patent extract was. The product thus obtained contained the aroma of the hop, which is very easily destroyed by a high heat.

The extract so obtained was less oily then the above, containing from 7 to 8 per cent. of tannin, and 12 per cent. of glucose. On exposure to 100°C, 13 per cent. of volatile matter was expelled, and at 110°C, an additional 9 per cent., the extract becoming quite dry, darker in color, losing its aroma, and breaking with little difficulty into small pieces. Water dissolved only a very small portion of the extract. Alcohol had only a slight effect, but dilute alcohol took up more. None of the ordinary solvents completely dissolved this extract. Amer. Jour. Pharm., April 1885, 166–168.

Meat Juice—Preparation.—Sippel recommends the following as the easiest way to obtain nearly all the juice:

Cut one pound of best lean beef in slices about one-third of an inch thick, and lay the slices one alongside of the other on a strip of muslin, 6 inches wide and 1 yard long, sprinkling with fine salt. Now roll up the whole strip, tie a string several times around, and put in an ordinary press. After half an hour, about half a pint of red, transparent juice will be obtained. Amer. Jour. Pharm., Jan. 1885, 25, from Pharm. Zeit. Russl., xxii., p. 600.

EXTRACTA FLUIDA.

Fluid Extracts.—Use for making Decoctions, Infusions, Syrups, and Tinctures.—Dr. E. R. Squibb refers to the circumstance that most manufacturers of fluid extracts publish and distribute formulas for making the above enumerated preparations from fluid extracts, and judges that the practice of using fluid extracts in this way must be in common use, having frequent inquiry for such formulas. He speaks strongly against the practice, and remarks, among others, that it is bad enough for pharmacists to buy their fluid extracts instead of making them, but much worse to use them in this unauthorized way. Ephemeris, May 1885, 799–800.

Fluid Extract of Camelia—Formula, etc.—Dr. E. R. Squibb, in view of the difficulty of obtaining coca leaves of good quality (see *Coca*, under "Materia Medica"), and in the belief that tea may be found a good substitute, has made some experiments to determine a proper process for a fluid extract. He found some "basket fired" Japan tea to yield 2.87 %; a sample of Oolong tea yielded 3.12 % of caffeine; others varied between 2.2 and 2.8 %. He recommends his process of repercolation for making the fluid extract, using as menstruum a mixture of 20 parts of alcohol, 5 parts of glycerin, and 76 parts of water. The product obtained by him is described as an almost syrupy, transparent liquid, of a rich, dark, olive-green color, almost black, with a fragrant odor of the tea and its agreeable bitter taste. It has an apparent sp. gr. of about 1.095 weighed at 15°C, compared with water at its maximum density, as unity, while the menstruum, by the same standard, at the same temperature, has a sp. gr. of .982. When mixed with water, syrup, or wine, it makes an opaque mixture, but nothing settles out.—Ephemeris, July 1884, 605–612.

Fluid Extract of Coffee—Preparation.—Dr. E. R. Squibb recommends that a fluid extract of green coffee be prepared precisely like fluid extract of tea. The coffee should be powdered so as to pass through a No. 60 sieve. The preparation is more fluid than that from tea, and of a more dingy olive-green color. The mawkish taste and smell of raw coffee were very pronounced, and though less agreeable than those of tea, were not disagreeable. The sp. gr. is 1.096 at 15° C. The coffee from which the fluid extract was prepared contained 1.3 per cent. of caffeine. This would make this fluid extract about one-half the strength of that of tea, and, tested physiologically, the activity was found to be about in that proportion.—Ephemeris, July 1884, 616–619.

Fluid Extract of Roasted Coffee—Preparation, &c.—Dr. E. R. Squibb having satisfied himself that coffee loses no caffeine during the process of roasting (see *Caffeine* under "Organic Chemistry"), prepares a fluid extract of roasted coffee made precisely like fluid extract of tea (see above), except that the coffee is moistened with its own weight of menstruum, and packed more tightly in the percolator. The finished fluid extract is of a very deep, rich brown color, almost black, slightly syrupy in consistence, with the well-known odor and taste of well-made good coffee. In physiological effects 120 minims are equal in effect to 150 minims of fluid extract of green coffee (see *Caffeine*—Physiological effects).—Ephemeris, Sept. 1884, 644.

Fluid Extract of Coca.—Hypnotic dose. See *Hydrochlorate of Cocaine* under "Organic Chemistry."

Liquid Extract Cinchona—Modification of Redwood's Process of Preparation.—(see Proceedings 1884, p. 63). Liquid extract of cinchona containing 5 per cent. of mixed alkaloids is now recommended by Professor Redwood to be prepared as follows: One pound avoir. of red cinchona bark in No. 60 powder is exhausted by digestion and percolation with ½ fluidounce of hydrochloric acid and distilled water, and the percolate is evaporated below 180° F. to the consistence of a firm extract. If on dissolving 30 grains of this extract in 2 drachms of hot distilled water it gives more than a slight precipitate on cooling, the whole of the extract should be similarly treated and the clear liquid again evaporated to the consistence of a solid extract, the alkaloidal strength of which is to be determined.

The liquid extract is then prepared by taking as much of the solid extract as contains 1 ounce of total alkaloids, adding five fluidounces each of glycerin and water, heating over a water bath until solution is effected, and when cool, adding 5 fluidounces of alcohol and as much water as is required to make the product measure 20 fluidounces.—Amer. Jour. Phar., May 1885, 267; Phar. Jour. and Trans., December 6, 1884, p. 411.

Fluid Extracta of Serpentaria.—Use as a remedy in poisoning by *Rhus Toxicodendron*, which see under "Materia Medica."

Fluid Extract of Verbena Hastata.—Mr. Alexander A. Weber suggests the preparation of a fluid extract from the root of *Verbena hastata*, using diluted alcohol as the menstruum. Amer. Jour. Phar., Dec. 1884, 616.

Fld. Extr. Teucrium Scordium—Formula, etc.—This drug has been used with advantage in hemorrhoids, both locally and internally. Louis Murjahn has prepared a *fluid extract*, by exhausting the powdered herb with diluted alcohol in the usual manner; it is of a blackish-green color and is given in doses of 1 or 2 fluidrachms. On evaporating this liquid, about 16 per cent. of a soft dark green *extract* is obtained, which has been used in the form of pills, one grain of it being combined with two grains of the powdered herb. For local use the *ointment* was prepared by mixing one part of the finely powdered herb with 9 parts of petrolatum.—Amer. Jour. Phar., Dec. 1844, 616.

Fluid Extract of Corn Silk—Improved Formula.—J. M. Hillan prepared a fluid extract by M. Kennedy's formula (Amer. Jour. Phar., 1883, p. 243), and found it to occasion a precipitate. Made from the dried corn silk by the same process, the preparation was permanent; but the author recommends to increase the glycerin, using for 100 gm. of dry corn silk 25 gm. of glycerin and sufficient diluted alcohol to obtain 100 ccm. of fluid extract.

C. H. Oberholtzer observed that the fluid extract prepared by Mr. Kennedy's formula would ferment (?), and recommends as a menstruum a mixture composed of two parts of alcohol and three parts of water, using 100 gm. of green corn silk for obtaining 100 ccm. of fluid extract.—Amer. Jour. Pharm., Nov. 1884, 571.

Fluid Extract of Convallaria Majalis—Improved Formula.—The most satisfactory results, according to Wm. E. Cassell, are obtained by using for 16 troy ounces of the drug a menstruum composed of 3 fluidounces of glycerin, 5 fluidounces of water, and 8 fluidounces of alcohol, and exhausting finally with diluted alcohol. Fourteen fluidounces of the percolate are reserved, and the remainder is mixed with 1 fluidounce of glycerin, evaporated to two fluidounces, and mixed with the reserved portion.—Amer. Jour. Pharm., Dec. 1884, 616.

GLYCERITA.

Glycerinum Aluminis—Value as a Local Astringent.—A glycerite of alum, prepared by dissolving 1 oz. of alum in 5 ozs. of glycerin by the aid of gentle heat, is recommended by Mr. R. W. Parker as useful where a powerful local astringent is required. It is stated to have the advantage over tannin, in being far less disagreeable, equally astringent, and quite compatible with the administration of iron. When diluted with water it forms a useful gargle, injection or lotion.—Pharm. Jour. and Trans., Jan. 31, 1885, 613; Brit. Med. Jour., Jan. 24, 1885, 178.

Glycerite of Ferrous Iodide—Formula for a Concentrated Preparation.—See *Ferrous Iodide* under "Inorganic Chemistry."

Gelatina Glycerini (Glycerin Jelly)—Formula.—Mix in a mortar 140 Castile soap and 210 glycerin; add, gradually, 1,680 expressed oil of almond (in cold weather only 1,260 will be necessary), and scent with 4 oil of thyme, 8 oil of bergamot, and 2 oil of rose.—Amer. Jour. Pharm., May 1885, 242; L'Union Pharm; Ph. Ztg., No. 21, 1885.

Glycerine Jelly—Preparation for Microscopic Mountings.—In place of fir or Canada balsam, which has hitherto very generally been used for this purpose, glycerin-jelly may be used with great advantage. This must be prepared for this purpose with great care. The finest colorless gelatin is soaked in water until it melts, after the excess of water has been poured off, at the boiling point of water. The whole of the soaked gelatin is now melted in a glass-vessel by dipping the latter in boiling water;

glycerin is carefully added by drops and thoroughly mixed with it, until the proportion is such that the mass, after having been allowed to become solid, will melt at exactly 50° C. (122° F.). This point is important, because a glycerin-jelly melting at a higher temperature easily abstracts water from the object, and thereby may alter its natural appearance.—Ind. Blätter; Amer. Drug., Dec. 1884, 232.

INFUSA ET DECOCTA.

Decoction and Infusion of Cinchona Bark—Inferiority as Representatives of the Drug.—Mr. B. H. Paul has made a number of experiments which very completely show the inferiority of decoctions and infusions of cinchona bark. Thus six samples of bark were found to contain respectively 28.47, 19.67, 28.9, 30.19, 35.4, and 28.77 grains of total alkaloid in 1¼ ounce. Decoctions made by the B. P. process, from these, contained respectively 4.54, 4.17, 6.5, 10.3, 15.5 and 8.33 grains of total alkaloids, showing that the original portions, each of 1¼ oz. of bark, had retained 23.93, 15.50, 22.4, 19.89, 19.9 and 20.44 grains respectively. The difference in the relation of the extracted to the unextracted portion is due to the variable proportion of soluble alkaloids in the bark. Infusions prepared by the B. P. process from 1 oz. of the bark, containing respectively 24.15, 28.30 and 23.01 grains of total alkaloid, contained only 9.5, 12.86 and 6.08 grains, showing a retention by the treated bark of 11.65, 15.44 and 16.93 grains of alkaloid.—Phar. Jour. and Trans., July 26, 1884, 61.

Infusion of Digitalis—Prevention of Precipitate.—M. F. E. Valentine, after discussing the cause and quality of the precipitate produced in infusions of digitalis, made both by the Pharmacopœia of 1870 and 1880, recommends a slight change in the officinal process, whereby the formation of a precipitate is completely prevented. The change consists in the addition of 1 ounce (15 parts) of glycerin to each pint (200 parts) of the infusion. According to this formula a preparation was made which showed no indication of any precipitation after a period of three weeks. The change of taste produced by the presence of the glycerin is slight and of such a nature as to render the preparation more agreeable than heretofore, and no exceptions to the use of it could justly be taken on these grounds, nor could any objectionable therapeutic effect possibly arise from its presence.

In the course of experiment an infusion was made to which a small quantity of solution of potash was added with a view of preventing precipitation. As far as this object was concerned it was quite successful, but objections to its use arise from the fact that a deep red color and a decided saponaceous taste are imparted to the liquid, effects which are objectionable.—Amer. Jour. Phar., Oct. 1884, 504–505.

Decoction of Valerian—Use as a Local Sedative.—Dr. Martel reports the successful use of a decoction of valerian, applied locally as a sedative. A crushed arm was first dressed with an antiseptic carbolic acid dressing, and afterwards, as soon as it was thought prudent, the water in the dressing was replaced by a decoction made by boiling 40 grams of valerian root in a liter of water for half an hour, straining and adding 10 per cent of carbolic acid. After its application, the pain, which had been very great, is said to have disappeared, and the wound became clean and healthy. It is stated that the country people in Normandy frequently use decoction of valerian to relieve pain in the case of wounds and fractures.—Brit. Med. Jour., Jan. 24, 1885, 199; Phar. Jour. and Trans., Jan. 31, 1885, 613.

Decoction of Lemon—Value in the Treatment of Ague.—Dr. Aitken, of Rome, reports a decoction of lemon to be a very valuable remedy in the treatment of ague. A dose is prepared by cutting a freshly gathered and unpeeled lemon into thin slices, adding three teacupfuls of water, boiling until reduced to one teacupful, and allowing to stand all night in the open air, when, after straining and filtering, it is ready for use, being given at one dose the first thing in the morning. Dr. Aitken says it has never seemed necessary to give more than one dose daily.—Phar. Jour. and Trans., Nov. 1, 1884, 144; Brit. Med. Jour., Oct. 1884, 653.

LINIMENTS.

Linimentum Ammoniæ—Preparation with Sesame Oil.—Mr. F. H. Alcock states that sesame oil makes a more satisfactory preparation than olive oil, or a number of other oils experimented with; even after standing three months there is no sign of separation, and the liniment presents a beautiful creamy consistence and color, but slightly altered during the time stated.—Amer. Jour. Phar., March 1885, 151; from Phar. Jour. and Trans., October 11, 1884, p. 282.

Saponimentum.—This is the name given by Mr. E. Dieterich to a new form of embrocation, consisting of a spirituous solution of soap in combination with various other substances, such as tincture of arnica, balsam of Peru, etc. The name is a generic one, and its application will be understood by quoting one formula:

Saponimentum Arnicæ.

Stearin soap	0.05 gms.
Alcohol	0.70 "
Tinct. Arnica (double)	0.25 "
Essent. oil of Arnica	5 drops.

Dissolve and filter.

Amer. Drug., Nov. 1884, 208.

LIQUORES.

Solution of Ferric Chloride—Modified Process.—In a former paper ("Pharmacist," July, 1869), Mr. R. Rother advocated the use of potassium chlorate for the development of ferric salts, thereby introducing into their solution a slight impurity in the form of potassium chloride. In the present paper the author, after considering the objections to the officinal process for solution of ferric chloride, proposes a modification, in which he advocates the use of barium chlorate, the barium being completely eliminated by the use of sulphuric acid in slight excess. The process is as follows:

Iron, in fine wire	53	parts.
Chlorhydric acid	320	"
Barium chlorate	25	"
Sulphuric acid	8	"
Water sufficient to make	400	"

Add the iron gradually to the chlorhydric acid, and when all has dissolved add the barium chlorate, in small portions at a time, during constant stirring of the mixture. When the incorporation, solution and decomposition of this is complete, pour in the sulphuric acid, previously diluted with half its weight of water, with constant stirring, and set the mixture away, so that the barium sulphate may subside. Now decant the clear solution, and transfer the turbid portion to a filter, and add water through the filter until the decantate and filtrate together weigh 400 parts, and mix them.

The author, furthermore, draws attention to a basic solution of iron, corresponding in ferric strength to the officinal.

Solution of Ferric Acetate, in which the acetic acid is replaced partly by *lactic acid* and partly by *hydrochloric acid*. Numerous basic combinations of ferric oxide and of those acids may be formed, among which the following, the author thinks, may prove valuable for therapeutic reasons, and might well replace both the officinal solution of ferric acetate, the so-called dialysed iron, and similar compounds. The compound forms a definite solution, and may be obtained as well in scales. In its composition it corresponds with the formula $Fe_3Cl\,Lc_2\,(OH)_6$, with a molecular weight of 483.4. The solution is remarkable for the fact that moderate temperatures do not disturb it, but boiling it a short time causes a profuse non-gelatinous precipitate, which promptly re-dissolves on cooling. The process for its preparation is as follows:

Solution of ferric sulphate	2,085	parts.
Sodium bicarbonate	850	"
Lactic acid	240	"
Diluted chlorhydric acid	364	"
Water sufficient to make	2,085	"

Mix the solution of ferric sulphate with 4,000 parts of water and gradually add it to the sodium bicarbonate (contained in a capacious capsule) with constant stirring. Now apply heat until effervescence has nearly eased ; dilute the mixture with 40,000 parts of water, and let the preipitate subside. Decant the supernatant liquid and treat the remainder wice more with the same amount of water and decant as before. Now our the washed precipitate upon a filter, and when the excess of adherng water has drained off, transfer it to a capsule and mix it with the lacic acid ; then add the diluted chlorhydric acid, warm gently, and when he precipitate has dissolved add sufficient water to make the solution eigh 2,085 parts. To obtain the salt in scales, evaporate the solution ently to a syrupy consistence and spread it out on plates of glass to dry. —Amer. Jour. Phar., August 1884, 407–414.

Solution of Ferric Chloride—Objections to and Improvement of the Presnt Formula.— Mr. Joseph W. England reviews the different methods hat have been officinal for the preparation of solution of ferric chloride nd the tincture, and arrives at the conclusions similar to those pointed ut by Mr. Rother, viz: That the present method pursued in preparing the iquor is radically wrong and defective in structure, if its object is to obain extreme purity of the finished product, through the impossibility of vaporating off the excess of nitric acid or even nitrogen oxides formed rom its decomposition ; and that the excess of hydrochloric acid present n the liquor in no way tends toward the etherization of the alcohol in naking the tincture, and lastly, that this result, *i. e.*, the etherizing of the lcohol, depends upon the presence of lower oxides of nitrogen arising rom decomposed nitric acid.

Mr. England, however, objects to Mr. Rother's formula, on the ground hat, unless great care is observed, there is danger either from the exploive character of the chloric acid formed, or the liability to retain a poionous impurity in the form of a soluble barium salt. He, therefore, ecommends the following formula for the preparation of the solution:

Iron, in the form of fine wire, and cut in small pieces, 15 parts (3¾ z. av.); hydrochloric acid, 59 parts (14¾ oz. av.); chlorine gas, disilled water, each a sufficient quantity to make 100 parts (25 oz. av.). lace the iron wire in a capacious flask, and pour upon it 54 parts (13½ z. av.) of hydrochloric acid, previously diluted with 25 parts (6¼ oz. v., or 6 fluidounces) of distilled water. Heat the liquid, slowly, until he reaction is ended, and effervescence ceases; then rapidly heat to the oiling point, filter through paper, and, having rinsed the flask and resilue with a little boiling distilled water, pass the washings through the ilter. To the filtrate add, immediately, 5 parts (1¼ oz. av.) of hydrohloric acid, followed by the addition of 20 parts (5 oz. av.) of boiling listilled water. Keep the liquid nearly boiling, and pass through it a tream of gaseous chlorine (generated in the usual way), agitating occaionally, until a small portion, tested with freshly-prepared test solution f potassium ferricyanide, gives no indication of the existence of a ferous compound by producing a blue precipitate. Lastly, add, after any free chlorine present has been removed by heat, sufficient distilled water to make the whole product weigh 100 parts (25 oz. av.).

From this solution the tincture can be prepared in the usual manner, and, if it is considered essential that the products of etherification be present, this might be accomplished by the addition of 5 per cent. of officinal spirit of nitrous ether. The author is furthermore of the opinion that an alcoholic solution is entirely unnecessary, and that the present tincture might well be substituted by an aqueous solution, conforming in strength, to which, if desirable, the spirit of nitrous ether might be added in the above-mentioned proportion.—Amer. Journ. Pharm., March 1885, 113–121.

Liquor Ferri Oxychlorati, Ph. Germ.—*Modification of Formula.*—Mr. Wilh. Weber draws attention to the direction of the German Pharmacopœia to effect the solution of the hydrated ferric oxide by means of hydrochloric acid, which, in view of the fact that this has to convert a portion of the ferric oxide into normal ferric chloride, he proposes to substitute by ferric chloride already formed. In following the direction of the officinal process he therefore recommends the substitution of the 3 parts of hydrochloric acid required by 3.9 parts of liquor ferri sesquichlorati.—Arch. d. Pharm., Nov. 1884, 855.

Liquor Ferri Dialysatus.—Examination of Trade Samples and Formula.—Mr. J. Oldham Braithwaite, having observed considerable variation in the liquor ferri dialysatus of commerce, has subjected fifteen samples to examination, and gives the results, together with that obtained from a preparation made by simple solution of ferric oxide by the aid of liq. ferri chloridi, and of the same subjected to dialysis, in the following table:

No.	Sp. gr. at 60° F.	Fe_2O_3 per cent. by Weight.	Fe_2O_3 grs. in f ʒ j.	Cl. per cent. by weight.	Cl. grs. in f. ʒ j.	REMARKS.
1	1.0632	5.929	3.44	1.250	0.720	Liquor Ferri Chlorox. not dialyzed.
2	1.0414	4.539	2.48	0.060	0.034	“ “ “ dialyzed.
3	1.0385	3.908	2.21	0.224	0.120	Trade Sample.
4	1.0531	5.548	3.19	0.596	0.340	“ “
5	1.0384	3.846	2.18	0.663	0.370	“ “
6	1.0509	5.328	3.06	0.535	0.300	“ “
7	1.0476	5.038	2.88	0.442	0.250	“ “
8	1.0550	6.153	3.54	0.398	0.220	“ “
9	1.0416	4.416	2.51	0.102	0.050	“ “
10	1.0492	5.222	2.99	0.529	0.304	“ “
11	1.0231	2.583	1.34	0.145	0.080	“ “
12	1.0491	5.210	2.98	0.730	0.410	“ “
13	1.0523	5.354	3.07	0.785	0.450	“ “
14	1.0534	5.859	3.37	0.318	0.180	“ “
15	1.0482	5.043	2.88	0.605	0.340	“ “
16	1.0110	1.244	0.69	0.154	0.080	“ “
17	1.0488	4.011	2.29	0.672	0.380	“ “

It will be observed that the trade samples in the majority of cases approach more nearly the liquor ferri chloroxydi (1) than the same dialyzed (2). The author suggests the following formula as affording a ready and satisfactory method of preparation: Take of stronger solution of perchloride of iron, 49 parts; stronger solution of ammonia, 32½ parts; distilled water a sufficiency. Dilute the solutions, precipitate and wash thoroughly in the usual manner, and then drain and transfer to a closed vessel, adding 7 parts of stronger solution of perchloride of iron. Allow to stand with occasional agitation until solution is completed, then transfer to a dialyser, charging the external vessel with distilled water, and changing it every twelve hours. In fourteen days dialysis is practically complete. If diluted to a gravity of 1.033, the resulting solution will contain two grains to each fluid drachm. If a 5 per cent solution is desired, this may be obtained by diluting to a gravity of 1.048.—Phar. Jour. and Trans., Mar. 7, 1885, 729.

Liqaor Calcis Saccharatus—Cause of Coloration.—Mr. John R. Hill has made a series of experiments to determine the cause of coloration of liquor calcis saccharatus. He arrives at the conclusion that neither light nor heat are concerned in this change, the latter, indeed, being probably beneficial rather than otherwise, since it causes a more intimate combination of the lime and sugar. He finds the development of color to be due to the action of atmospheric air alone, and recommends that it be stored in bottles quite full and securely corked. His investigations also show that to prevent coloration the liquor should not be filtered, but decanted or syphoned off, as directed by the B. P. The liquor is readily prepared, and should never be made in too large a quantity at a time. The liquor which has become colored cannot, as far as the author has observed, be again decolorized. Even digestion with animal charcoal is without effect.—Amer. Jour. Phar., April 1885, 178–182; Pharm. Jour. and Trans., Jan. 24, 1885, 595.

Solution of Subacetate of Lead.—Value as a test for the detection of foreign oils in *olive oil*, which see under "Organic Chemistry."

Solution of Acetate of Magnesium—A New Substitute for Solution of Citrate of Magnesium.—Mr. A. F. W. Neynaber recommends acetate of magnesium as an efficient laxative, and proposes the following formulas for a solution to replace that of citrate of magnesium: Carbonate of magnesium, 200 grains; acetic acid, sufficient quantity to neutralize; syrup of citric acid, 1,200 grains; bicarbonate of potassium, 30 grains; water enough to fill a bottle of about 16 fluidounces. Calcined magnesia, 126 grains; acetic acid, sufficient quantity to saturate; syrup of citric acid, 2 fluidounces; bicarbonate of potassa, 40 grains; water sufficient to fill a bottle of the usual size.—Amer. Jour. Pharm., Sept. 1884, 472.

Solution of Bismuth and Pepsin—Preparation.—Mr. R. Rother suggests the following formula for preparing an absolutely permanent acidulous solution of bismuth and pepsin, which deserves more than passing attention:

Pepsin, saccharated	250 parts.
Bismuth citrate	100 parts.
Potassium bicarbonate, sufficient.	
Diluted chlorhydric acid	20 parts.
Alcohol	1,000 parts.
Water sufficient to make	10,000 parts.

Mix the diluted chlorhydric acid with 3,000 parts of water, add the pepsin, and macerate the mixture for several days, or until the pepsin is dissolved; then add a crystal of potassium bicarbonate, and when effervescence has ceased, decant the solution. Mix the bismuth citrate and 40 parts of potassium bicarbonate with 4,000 parts of water, and heat the mixture until effervescence has ceased, and filter the solution. Mix the alcohol with 1,000 parts of water, and add it to the pepsin and bismuth solutions previously mixed together with enough water to make the solution weigh 10,000 parts.—Amer. Jour. Pharm., July 1884, 353–355.

Liquor Ipecacuanhæ et Morphinæ—Preparation.—Mr. Edwin H. Hess draws attension to this preparation, which originated with Dr. J. D. Coleman, of Mount Holly (afterwards of Trenton), N. J., and which enjoys considerable local reputation. The formula is as follows: Take of acetate of morphine, one dram; diluted acetic acid, one fluidounce; diluted alcohol, seven fluidounces; wine of ipecac, two fluidounces. Dissolve the acetate of morphine in the acid, add the diluted alcohol and wine of ipecac, and mix the whole thoroughly. Set aside for twenty-four hours, then filter through paper. The preparation enters into the composition of a medicine which is locally known as

Red Drops, viz: Tinctura catechu composita, ℥v; spiritus camphoræ, ℥i; liquor Doveri, ℥ij. This is quite an efficient remedy for diarrhœa, dysentery, cholera morbus, and all summer complaints in general.—Amer. Jour. Phar., May 1885, 235–236.

MISTURÆ.

Borobenzoate of Sodium Mixture—Formula.—Mr. Thomas S. Wiegand communicates the following formula of Dr. D. H. Agnew, which is evidently intended to contain *borobenzoate of sodium* (which see under "Organic Chemistry").

℞. Sodii biboratis	ʒij
Acidi benzoici	ʒiss
Spir. juniperi,	
Syr. hypophosphitum	āā f.℥ij.

M.—Sig. A tablespoonful 3 times daily.

—Amer. Jour. Pharm., Dec. 1884, 616.

Mixture for the Cure of Piles—Formula.—The following formula is highly recommended by a writer in "Brit. Med. Jour." (Oct. 1884, 292): Potas. bromid., ʒij; ext. ergotæ liq., ʒijss; tr. nucis vom., ʒj; sp. ammon. arom., ℥iss; aquæ, ad ℥viij. M.—Sig ℥j Four times a day. —Phar. Jour. and Trans., Nov. 1, 1884, 344.

Gelatinized Benzin—A New Detergent.—The following formula for a gelatinous mixture, containing benzin, and forming an excellent detergent, is given in "Rundschau." Dissolve 120 parts of white (castile) soap in 180 parts of hot water, add to the solution 30 parts of water of ammonia, dilute with water to 750 parts, and then add enough benzin to make 1,000 parts.—Amer. Drug., Feb. 1885, 35.

PILULÆ.

Pills—Practical Observations.—Mr. Joseph Ince has read a lengthy paper on "Pills" before the Chemists' Assistants' Association (March 25th, 1885), which will be studied with great interest by dispensers. The paper does not admit of condensation, and its great length precludes its reproduction in this report. Reference must therefore be had to the original in Phar. Jour. and Trans., June 6 and 13, 1885, 1009–1012 and 1027–1032.

Pills—A New Coating Material.—See *Keratine*, under "Organic Chemistry."

Pill-Mass of Copaiba—New Method of Making.—Mr. Wm. Kirchmann suggests the following method for making copaiba pills, which remain soluble and retain their proper consistence. A quantity of the copaiba is first made into an emulsion with the usual proportion of gum arabic, then a quantity of calcined magnesia amounting to $\frac{1}{10}$ of that of the balsam is added, whereupon the mass will acquire the consistence of an ointment after about twelve hours; it will, however, not be sufficiently hard to form pills. If now a very small quantity of borax is added (which, as is well known, causes the coagulation of the gum), a beautiful pill-mass is produced, which leaves nothing to be desired. On taking some of this into the mouth, it is soon dissolved to an emulsion under the influence of the saliva and the bodily warmth. The mass keeps well; after a time, however, it requires to be kneaded in a warmed mortar before it can be formed into pills.—Amer. Drug., Nov. 1884, 207; Jour. Phar. Ztg.

Pilula Hydrargyri—Presence of Oxides, etc.—See *Mercurial Preparations,* under "Inorganic Chemistry."

Blaud's Pills—Improved Formula.—The suggestion of Kirchmann (see above) of using a little borax for improving the pill-mass of copaiba, has induced C. Deupser to try the same salt in Blaud's pills, and the result was highly satisfactory. The author gives the following directions:

	Gm.	Grains.
Sulphate of iron (ferrous)	15.0	240
Carbonate of potassium	15.0	240
Mucilage	8.0	128
Sodium borate	0.1	1½ (to 2)
Althæa root, powd	1.5	24
Tragacanth, powd.	0.5	8
Glycerin.	a few drops.	

Reduce the sulphate of iron and the carbonate of potassium, each separately, to a fine powder, mix them, add the mucilage, and triturate till a sticky green mass is formed. Next add the borax, and mix thoroughly. During the trituration the mass will be distinctly felt to become harder, and after standing 15 minutes, it will have become almost pulverulent. The althæa and tragacanth are now added, together with a few drops of glycerin, so that a pill-mass of proper consistence is formed, which is to be divided into 100 pills. The latter will be found to be comparatively small, of a fine green color, and retaining their softness for some time.—Amer. Drug., Dec. 1884, 228; from Rundschau (Leitmeritz).

Blaud's Pills—Modification of Process of Preparation.—John A. Murtaugh obtains a satisfactory pill-mass by using exsiccated ferrous sulphate and well-dried potassium carbonate, forming the mass with powdered liquorice root (see Amer. Jour. Phar., 1883, p. 141). But compression is preferred, ¼ grain of acacia or of sugar being added for each pill to the mixture of dried salts, to render the powder sufficiently adhesive. As a still better method for preserving these pills, it is suggested to introduce into the mould about ½ grain of powdered sugar, then the pill, cover with ½ grain of sugar, and compress.—Amer. Jour. Phar., Nov. 1884, 572.

Pills of Permangate of Potassium—Formula.—A Russian pharmacist recommends the following formula:

Vaseline	1 part.
Paraffin,	
White wax, of each	2 parts.
Fuller's earth.	3 parts.

Melt the first three together, and add the "white bole" when the mixture is cold. Add to this the permanganate, previously powdered in a mortar, and roll out with a pill-machine made of horn or wood.—Amer. Drug., Sept. 1884, 164.

PULVERES.

Powders—Cause of Adhesion to One Side of Shop Bottles.—A correspondent of "Pharmaceutical Journal and Transactions" (Jan., 1885, 616), asserts that the adherence of powders to one side of a bottle, a phenomenon that has doubtless been observed by most pharmacists, and which is generally attributed to traces of moisture on the sides of the bottle, is due to an attractive power exercised by light. Having had occasion to remove a label from the front of a bottle containing powder, he found that the inner surface of the bottle, exactly behind the label, was quite free from powder, while the glass all around it was covered with a closely adhering layer.

Seidlitz Powders—Care Necessary in Weighing.—Mr. William Martindale having complaint made that some Seidlitz powders supplied from his establishment formed a "scum" on the surface of the liquid when mixed, examined into the matter, and found it due to a slight excess of tartaric acid employed. He finds that when the water is cold, its quantity comparatively small, and the tartaric acid in excess of the quantity necessary to form neutral tartrate of sodium, the conditions necessary to the phenomenon prevail, bitartrate of potassium being formed and causing a "scum" on the surface of the mixture and a deposition on the sides of the glass. In the cases observed by him, the quantities of tartaric acid varied from 35.5 to 39.5 grains, 36 grains being the quantity intended for each Rochelle powder containing 40 grs. of bicarbonate of sodium.—Yearbook of Pharm., 1884, 512–516.

Granulated Magnesium Citrate—Examination of Commercial Samples.—James A. Pool examined three commercial specimens, and determined the percentage of

Magnesium carbonate,	3.9	1.0	3.2
SO_3	4.3	1.0	0.7
CO_2	12.5	7.5	10.5

In addition to these, sodium, potassium and citric acid were found, and neutral solutions of each specimen, on being boiled with silver nitrate, yielded a metallic mirror, which was regarded as evidence of the presence of tartaric acid.—Amer. Jour. Pharm., Nov. 1884, 572.

Hydrargyrum Cum Creta—Presence of Oxides, etc.—See *Mercurial Preparations*, under "Inorganic Chemistry."

Cholera Powders—Composition of a New Remedy.—A new remedy for cholera is described by Shamsudin J. Suleimani, of Bombay. Four cases of cure and one of failure are recorded. The ingredients used are the root of *Delphinium denudatum* (Iadavari khatai), the seeds of *Strychnos Ignatii*, the kernel of the fruit of *Lodoicea Seychellarum*, and cardamoms. These are powdered and given in 10-grain doses to adult patients every hour or two, according to the severity of the symptoms. It is mentioned, however, that sinapisms to the epigastrium, or a mixture of chloroform and laudanum sprinkled over a piece of lint and applied for about five minutes, are used to stop vomiting, as well as friction and warm bottles to the extremities.—Phar. Jour. and Trans., May 2, 1885, 890, from *Lancet.*

Powdered Meat—Improved Process.—Mr. P. G. Dannecy has improved the method heretofore employed by his father, Mr. G. Dannecy, as follows: The meat is immersed and left for at least one hour in about ten times its volume of boiling water, containing 1 per cent. of salt. It is then taken out, allowed to cool, and cut in thin slices (about 3 to 4 millimeters thick). These pieces are dried upon cloths in a well ventilated drying oven, at a temperature of 40 to 50 degrees. After three hours they are sufficiently dry to be rubbed to powder, which may be done in a marble mortar with a wooden pestle.—Amer. Drug., June, 1885, 103; from Rep. de Pharm., 1885, 52.

SAPONES.

Soaps of Pharmacy—Commercial Quality.—Mr. M. Dechan, having been engaged for some time past in investigating the composition and properties of commercial soaps, was led to undertake the analysis of such as are more or less frequently employed in pharmacy. Generally speaking, he found that the samples examined are to be relied on for their quality and the complete saponification of the fat employed, though in a few instances the purity of the oil might have been called in question. In almost every case the combined alkali is in excess of the quantity required to form the normal salt, and in several samples there is a considerable percentage of free alkali. Four different samples of each of the soaps, enumerated in the table were examined, the results given being the average:—

	Four different samples each of	Fat.	Combined alkali	Free alkali	Sulphate.	Chloride	Silica	Insoluble matter	Water	Insoluble in alcohol
1	Sapo durus	81.5	9.92	0.08	0.08	0.20	0.00	0.20	10.65	0.5
2	Sapo animalis	78.3	9.57	0.28	0.11	0.36	0.00	0.40	12.50	1.1
3	Sapo castil. alb.	76.7	9.14	0.09	0.07	0.29	0.00	0.90	13.25	0.6
4	Sapo castil. (mottled)	68.1	8.90	0.19	0.13	0.50	0.15	0.83	21.70	1.3
5	Sapo mollis	48.5	12.60	0.38	0.23	0.70	0.17	1.00	39.50	1.6

Phar. Jour. and Trans., April 25, 1885, 872.

Sulphur Soap—Preparation.—A correspondent of the Seifenfabrikant recommends to prepare an efficient and homogeneous sulphur soap in the following manner:—Grind or rasp very dry "ground soap," that is, such soap which is prepared from best *fresh* fats, and in which the whole of the latter is saponified (a dried quantity of Conti's white Castile soap will answer very well), and add to it the requisite quantity of sulphur dissolved in linseed oil. To prevent the mixture from becoming semi-liquid, add to it enough powdered orris root, which serves at the same time as perfume, and potato flour to impart to it the requisite consistence. The grinding and rasping is best performed by the regular machines of the soap manufacturer, and the finished mass should also be passed through the machine, after which it may be formed in suitable pieces. If no machine is available, the mixture may be prepared in an ordinary mortar and afterward formed by hand.—Amer. Drug., March 1885, 49.

SPIRITUS.

Spiritus Ammoniæ Aromaticus—Cause of Brown Color in the New Preparation.—Mr. Andrew Blair, having had complaint on account of the more or less deep brown color which aromatic spirit of ammonia, made according to the formula of the Pharmacopœia of 1880, acquires, was led to investigate the subject, and finds the trouble to lie in a trifling change, i. e., the substitution of oil of nutmeg by oil of pimento. In all other respects the formula of 1880 corresponds essentially with the well tried and satisfactory formula of 1870. The condition of the formula of 1880, that *recently distilled* alcohol should be used, the author finds may well be disregarded. He observes that this is one of the many absurd hindrances put in the way of pharmacists by the revisers of the Pharmacopœia of 1880, and that this and similar hindrances have had the tendency to discourage and prevent pharmacists from making their own preparations. A satisfactory preparation, conforming as near as possible with the formula of 1880, is obtained by substituting oil of nutmeg for oil of allspice—the formula then reading as follows:

Carbonate of ammonium	40	parts.
Water of ammonia	100	“
Oil of lemon	12	“
Oil of lavender flowers	1	“
Oil of nutmeg	1	“
Alcohol	700	“
Distilled water, q. s. ft.	1,000	“

—Amer. Jour. Phar., Feb. 1885, 79–80.

Sweet Spirit of Nitre—Examination of Very Old Specimens.—Mr. Peter MacEwan has had opportunity to examine six specimens of spirit of nitrous ether, which had been prepared in 1857 or 1858, and described at an evening meeting of the North British Branch of the Pharmaceutical Society, held January 14, 1858. The results of the examination showed an increase in the specific gravity of each sample, being corroborative of a previous statement that increase in specific gravity is one of the results of deterioration. It is further shown that some of the samples lost their color, others their odor completely, and that in the course of time the nitrous constituent of sweet spirit of nitre entirely disappears; that aldehyde, one of the most readily oxidizable bodies, remains; and that in sweet spirit of nitre made from methylated spirit, formic acid is one of the products of decomposition.—Amer. Jour. Pharm., April 1885, 189–192; Phar. Jour. and Trans., Feb. 21, 1885, p. 675.

Spirit of Nitrous Ether.—Estimation of *Ethyl Nitrate*, which see under "Organic Chemistry."

Spiritus Odoratus—Formulas.—Mr. R. Rother offers some general suggestions as to the proper method of making cologne waters, and other perfumes, and gives the following formulas:

Take of Oil lemon	½ fl. drachm.
Oil rose	40 drops.
Oil orange flowers	15 drops.
Orris root in coarse powder	1½ drachms.
Tonka bean in coarse powder	1 drachm.
Musk in grain	7 grains.
Alcohol, 80%	24 fl. ounces.

Mix and macerate for seven days, and then filter.

The improvement the author would suggest in this formula is to employ a full strength highly rectified or deodorized alcohol, commercially termed "cologne-spirit," and first prepare with this a tincture of the orris and tonka, to which the other ingredients should be added and the mixture again filtered after due maceration.

Take of Oil bergamot	12 fl. drachms.
Oil lemon	6 "
Oil lavender flowers	2 "
Oil orange flowers	2 "
Oil rose	2 "
Musk, grain, genuine	4 grains.
(Or good commercial extract musk, 16 fl. drachms.)	
Cologne spirit	7½ pints.
Water sufficient to make	8 pints.

Mix the cologne-spirit with 5 fluid ounces of water, and add the remaining members of the formula; macerate the mixture for five days and filter.—Amer. Drug., Oct. 1884, 181–182.

Cologne Waters—Formulas.— The following formulas are given in "Rundschau Leitmeritz," 1885, No. 7:

Cologne Water, I.—10 oil of bergamot, 5 oil of lemon, 1 oil of lavender (best), 5 oil of rosemary (rectified), 1 oil of cloves, 1 oil of neroli (best), 0.2 oil of ylang ylang, 1 acetic ether, 1 acid acetic, 825 alcohol, 150 distilled water. Warm this mixture to 70° or 75° C., then keep in a cool place for two days, and filter. Heating to such a temperature improves a Cologne water considerably, and makes it resemble the distilled perfume, surpassing the simple mixture of the ingredients. The true Cologne waters are either acid or alkaline in character. No. I belongs to the former class; those of the latter class contain a little ammonia;

but it should be remembered that the oils of lavender and rosemary acquire a strong unpleasant odor in presence of free alkali.

Cologne Water, II.—10 oil of bergamot, 5 oil of lemon, 2 oil of rosemary, 1 oil of neroli, 0.5 oil of lavender, 0.2 ammonia water, 885 alcohol, 100 distilled water.

Cologne Water, III., for bathing.—2 oil of citronella, 2 oil of lemon, 5 oil of bergamot, 5 oil of rosemary, 2 oil of sassafras, 1 oil of cloves, 1 oil of wintergreen, 10 acetic ether, 800 alcohol, 200 distilled water. Prepare as above. For distilling, add one-half more of water, and distil very slowly, avoiding unnecessary heat.—Amer. Jour. Pharm., June 1885, 292.

Cologne Water.—Dr. A. Frank has communicated the following formula:

Oil of bergamot	
Oil of lemon	āā ½ oz.
Oil of Canada snake-root	40 min.
Oil of cassia,	
Oil of lavender (English),	
Oil of clove	āā 20 min.
Oil of rose geranium	½ oz.
Oil of sandalwood	10 min.
Oil of rose	30 "
Oil of neroli	5 "
Essence of jasmin	2 oz.
Tincture of orris (1 oz. to Oj.)	8 oz.
Compound tr. of ambergris	1 oz.
Cologne spirit	5 pts.
Water, to make	1 gal.

—Amer. Drug., Nov. 1884, 118.

SUCCI.

Succus Taraxaci.—Examination of Commercial Samples.—Messrs. William Elborne and H. Wilson, with a view to furnishing some supplementary information to corroborate the experience of previous experimenters, have prepared "Succus taraxaci" from autumnal roots (gathered in October, 1884), and from spring roots (gathered in March, 1885). From 4 pounds of the former they obtained 16 fluidounces of dark-colored juice; from 2½ pounds of the latter 10 fluidounces of a thick fawn-colored juice. Six samples of taraxacum juice were also procured from chemists in the different towns designated in the table. The sp. gr. of each sample having been taken, half an ounce of each was evaporated on a water oven, dried and weighed. The residue was then treated with absolute alcohol, and the alcoholic extract evaporated to dryness and weighed. The results are shown in the following:

	Authentic Samples.		Purchased Samples.					
	Autumnal Root.	Spring Root.	London.	Liverpool.	Manchester	Birmingham.	Edinburgh.	Coventry.
Specific gravity of crude juice	1.067	1.049						
Specific gravity of succus	1.021	1.019	1.002	.981	1.404	.977	.988	1.003
Extractive obtained from half fluid oz. of succus in grains	23.180	21.7	16.89*	6.97	11.19	7.0	7.13	16.27
Amount of extractive soluble in alcohol in grains	3.72	2.8	7.28*	1.08	1.86	.93	1.53	1.70

* Would not solidify at 100°.

The color of the purchased samples was fairly constant, but they varied considerably in taste. The color of the authentic samples was altogether darker, and the taste stronger than in the purchased ones.—Pharm. Jour. and Trans., April 11, 1885, 832.

SUPPOSITORIA.

Suppositories—New Forms.—The "American Druggist" draws attention (March 1885, 48) to some new forms of suppositories, as follows:

Hollow Suppositories of Gelatin.—These are provided with a lid or cap, which may be fused on without difficulty, after the ingredients have been introduced into the cavity.

Canellated Suppositories.—These are provided with grooves on the outside, which are said to facilitate their introduction, and the underlying idea in this case seems to have been the principle of the rifled cannon, or rather that of the "rifled cartridge."

Quinine Suppositories — Medicinal Value.— Dr. R. Peck states that quinine may be easily administered to children in the form of suppositories, and that the drug is not only rapidly and promptly absorbed in this way, but that also far larger doses may be given than by the mouth. He made use of from 16 to 24 grs. of muriate of quinine at a single dose, adding about 30 grs of butter of cacao and a small quantity of simple cerate as mass for the suppository.—Amer. Jour. Phar., January 1885, 34; from Deutsche Med. Wochenschrift, 1884.

Suppositories of Cocaine.—Remarks as to Strength and Size. See *Cocaine* under "Organic Chemistry."

Iodoform Pencils—Preparation.—See *Iodoform* under "Organic Chemtry."

SYRUPI.

Fruit Syrup—Preparation with Wine.—The following formulas are given in "Erfind. und Erfahr.":

Syrup of Pineapple.—Cut 5 kilos of selected pineapples in small pieces, transfer into a bottle, add 5 kilos each of white wine and water, and macerate at a medium temperature for several days. Boil 30 kilos of sugar with 20 kilos of water, add the strained infusion, heat to ebullition, and strain through flannel.

Syrup of Apricot.—Digest, for six days, 5 kilos each of white wine, water and ripe apricots, freed from stones and cut into small pieces; strain, press very gently, and add to the hot syrup, prepared as above, 40 kilos of sugar and 30 kilos of water. When cold, add 200 gm. of artificial essence of apricots.—Amer. Jour. Pharm., April 1885, 174.

Syrup of Wild Cherry Bark—Modification of Officinal Process.—Mr. J. George Engler finds the U. S. P. process for preparing this syrup unsatisfactory, on account of the instability of the product and its liability to undergo fermentation. After a number of comparative experiments, he concludes that the following formula, following the pharmacopœial manipulation, produces a permanent syrup:

Wild cherry bark	℥v,
Bitter almond	ʒv,
Water	℥xvj,
Glycerin	℥ij,
Sugar	℥xxiv.

The author remarks that the syrup obtained by this formula has a strong odor and taste of hydrocyanic acid, which is as it should be, since he introduces a quantity of bitter almonds.—Amer. Jour. Pharm., April 1885, 168–170.

Syrup of Tolu—Relative Value of the Old and the New Pharmacopœial Processes.—Mr. P. Claasen communicates some experiments which show that the syrup of tolu made by the process of the Pharmacopœia of 1880 is far superior to that made by that of 1870, if it is conceded that the virtues of the syrup depend upon the presence of free benzoic and cinnamic acids. The process of the Pharmacopœia of 1870 requiring the use of carbonates of magnesium in order to secure a clear filtrate, the acids in the tincture unite with the magnesium salts. He therefore advises adherence to the formula of 1880, notwithstanding the finer appearance of the syrup made by that of 1870.—Amer. Jour. Phar., July 1884, 356–357.

Syrup of Tolu—Improved Process.—Mr. Fournier recommends the following process for making syrup of tolu: 15 parts of balsam of tolu are dissolved in 30 parts of alcohol of 85% in a suitable vessel at as low a temperature as possible; to the solution are added 100 parts of distilled or boiled and filtered water, and the whole distilled until 30 parts of highly aromatic alcoholic distillate are obtained. The still hot residue left in the vessel (flask, etc.), is then removed; this consists of an inodorous and insipid soft resin and a supernatant opaque and highly aromatic liquid, which, on cooling, separates some cinnamic acid (colored by resinous matter) amounting to about 1.5 per cent of the original weight of the balsam.

The liquid from which the acid had separated is first reduced by evaporation, if necessary, to 70 parts, then the cinnamic acid is dissolved in it by the aid of bicarbonate of sodium (about 110 parts of the latter for every 200 parts of the acid), and the alcoholic distillate added, which renders the liquid perfectly clear and transparent. This liquid has a faintly yellow color, and possesses a most agreeable taste and odor (particularly if 14 parts of tolu and 1 part of benzoin have been used instead of 15 parts of tolu), and contains all the cinnamic acid in form of a soluble salt, as well as one of the resins held in solution by the excess of the alkaline salt. If the distillation is carried on at a high temperature, the aroma of the product is accompanied by a disagreeable odor of toluene, but this is easily avoided.

To make the syrup, the author used the following proportions:

Syrup	950 parts.
Alcoholate of tolu	50 "

The product far surpasses the insipid preparation of the Codex.

As the balsamic properties of balsam of tolu are largely due to the cinnamic acid, the presence of the latter can easily be recognized by converting it into benzaldehyde by oxidizing agents.—Amer Drug., Febr. 1885, 26; from L'Union Phar., Dec. 1884.

A similar plan, though less elaborate, is one proposed by Van der Felde (in the Jour. de Ph. d'Anvers), which directs to prepare a glycerite of tolu as follows: Dilute 37 parts of solution of potash with 150 parts of water, add the mixture to 15½ parts of balsam of tolu contained in a capsule, and warm gently while stirring. Then add 222 parts of glycerin, concentrate the mixture to 300 gm. and filter. One part of this glycerite with 15 parts of syrup, is said to furnish a superior product.—Ibid., 27.

Syrupus Quassiæ.—Formula.—The following formula is given as useful in preparing a harmless fly poison: Macerate, during 24 hours, 1,000 parts of quassia wood with 5,000 parts of water, then boil for ½ hour. Set aside for 24 hours, and press. Mix the liquid with 150 parts of molasses, and evaporate to 200 parts. A weaker decoction of quassia does not kill the flies. From this the *Fly Water* is prepared as follows: Mix when needed, and dispense without filtering, 200 syrup of quassia, 50 alcohol and 750 water. It is used by moistening with the mixture a cloth or filtering paper on a plate.—Amer. Jour. Phar., June, 1885, 292.

Syrup of Corn Silk.—Preparation.—J. M. Hillan recommends dissipating the alcohol by mixing 12 parts of the fluid extract with 65 parts of sugar, and after the alcohol has evaporated, adding 5 parts of glycerin and sufficient water to make 100 parts.

C. H. Oberholtzer recommends mixing 35 parts of his fluid extract (which see) with 65 parts of simple syrup.—Amer. Jour. Phar., Nov. 1884, 571.

Syrupus Myrrhæ—Formula.—Abraham L. Ballinger examined several specimens of myrrh and powdered myrrh, and offers the following formula for a syrup:

Take of tincture of myrrh	ʒij
Magnesium carbonate	ʒj
Sugar	℥xij
Water	sufficient.

Rub the tincture with the magnesium carbonate, afterward with 8 ounces of water, filter and dissolve in the filtrate the sugar. The syrup should measure 15 fluid ounces. It has an agreeable flavor, makes a good vehicle for administering nauseous medicines, and can be made to take the place of syrup of tolu.—Amer. Jour. Phar., Nov. 1884, 571.

Ferrated Syrup of Peaches–Preparation.–This is said to be a delightful preparation, and may be made as follows: Take of good ripe peaches, free from stone, 1,000 parts (by weight); iron filings, free from copper, 50 parts, and sugar, 300 parts. Put the peaches in an iron vessel and mash them up, mixing sufficient water with them to make a paste; add the iron filings, and let the whole macerate for ten days, stirring frequently; then filter through a thick cloth to obtain the extractive matter. A little water is poured on the residue and filtered through paper. The filtrates are mixed, and to the fluid, which is of a brownish-green hue, is added the sugar. The mixture is now simmered at a moderate heat (not over 60°C.) to the consistence of a syrup. A clear greenish-brown fluid is the result, having the taste and smell of peaches, and giving the usual reactions of the iron preparations.—*Gazette de Medica di Torino.*—Amer. Drug., Oct. 1884, 200.

Syrupus Calcii Lactophosphatis—Modified Formula.—Mr. Geo. Thos. Williams has found the formula of R. Rother (see Proceedings 1884, 97) to yield a more stable preparation than that of the U. S. Pharmacopœia, and suggests a few slight modifications so as to make the preparation correspond to the officinal.

Take of	Precipitated calcium carbonate	13 parts.
	Lactic acid	33 "
	Phosphoric acid, U. S. P	18 "
	Orange-flower water	80 "
	Sugar in coarse powder	600 "
	Distilled water sufficient to make	1000 "

Mix the lactic acid with 136 parts of distilled water, and gradually add the calcium carbonate, warming gently, if necessary. Add the phosphoric acid previously diluted with 120 parts of distilled water and with the orange-flower water. Filter and pass enough distilled water through the filter to make the filtrate weigh 400 parts. Lastly, dissolve the sugar by cold percolation or by agitation and strain.

Syrup of the Phosphates of Iron, Quinine and Strychnine—Assay of Commercial Samples.—Mr. Josiah Clifton Cutting, after quoting the various names under which this preparation is known, which are, besides the officinal one: Eaton's Syrup, Aitkin's Syrup, Syrup of the Three Phosphates, and Syrup of Triple Phosphates—gives a detailed account of the various formulæ formerly proposed for preparing this syrup, and discusses their merits or disadvantages. He points out that the strength of the product, prepared by what is known as Aitkin's and Eaton's formulæ, does not correspond with the proportion of the ingredients claimed for it, since the several operations of mutual decomposition (to produce the ferrous phosphate), or precipitation, introduce discordant results. Moreover, he finds, as many others have before him, that the finished preparation does not keep well, becomes dark colored, and eventually deposits a sediment, probably due to oxidation of the iron salt, and to some action of the phosphoric acid upon the sugar or its coloring matter.

He finds the new officinal process (U. S. Pharm. 1880) to be the most satisfactory. With a view to devise a systematic process of assay for this preparation, he first made a sample of the syrup from standard ingredients prepared with the greatest care by himself. The author gives the details of the method of assay adopted, and then the results obtained with 13 commercial samples of the syrup, from which the following is gathered:

A standard syrup, prepared by the author himself, was found to yield in 20 grammes:

	Gm.
Total alkaloids	0.274
Quinine	0.269
Strychnine	0.005
Ferric oxide	0.0546
Phosphoric acid (P_2O_5)	0.513

The commercial samples varied greatly, the extremes being in 20 gm. of the syrup:

	Highest.	Lowest.
Total alkaloids	0.295	0.175
Quinine	0.295	0.173
Strychnine	0.014	0.005
Ferric oxide	0.1998	0.0476
Phosphoric acid (P_2O_5)	0.482	0.2276

—Amer. Drug., June 1885, 107.

Syrup of Hypophosphites with Iron—Formula for a Permanent Preparation.—Mr. Charles D. Randall proposes to substitute ferric citrate for ferric lactate in the preparation of the officinal syrup of hypophosphites with iron. He finds that when ferric citrate is dissolved in water with three equivalents of hypophosphite of sodium, a green compound is produced, which is identical with the compound produced when one equivalent of hypophosphite is dissolved in water by the aid of one equivalent of citrate of sodium. But the compound obtained by the latter method is liable to change in the presence of excess of hypophosphites, whilst that produced from ferric citrate is not, the author giving theoretical data in support of his view. On the basis of his experiments, Mr. Randall suggests that the preparation be made by the following formula, which is almost identical with that made by the process ordered in the pharmacopœia, each fluid drachm containing three grains of calcium hypophosphite and one grain each of the hypophosphites of sodium and potassium, and is sufficiently palatable without the aid of flavoring. The preparation contains the same amount of metallic iron as the pharmacopœia orders.

Calcium hypophosphite	554 parts	(or 591 grains).
Sodium bicarbonate	95 "	(or 101 "
Potassium bicarbonate	115 "	(or 123 "
Ferric citrate	85 "	(or 91 "
Sugar, powdered	4,050 "	(or 9 troy ounces).

Water, a sufficient quantity to make 10,000 parts (or 16 fluid ounces).

Dissolve the calcium hypophosphite, previously reduced to a fine powder, in 3,500 parts (or 8 fluid ounces) of water with the aid of heat, and add to the solution the sodium bicarbonate, continuing the heat until action has entirely ceased. After removing the solution from the heat, add the potassium bicarbonate in small portions, waiting after each addition until effervesence has ceased before adding more. When action has entirely ceased, filter the liquid through paper. After the liquid has ceased to drop, add enough water through the filter to make the filtrate weigh 5,850 parts (or measure 10 fluid ounces.) In 1,200 parts (or 2 fluid ounces) of this liquid dissolve the ferric citrate with the aid of heat, and add the solution to the balance of the liquid. In this solution dissolve the sugar with or without the aid of heat and filter through paper, adding through the filter enough water to make the completed syrup weigh 10,000 parts (or measure 16 fluid ounces).—Amer. Jour. Pharm., July 1884, 357–361.

Syrup of Dentition—Formula.—Mr. W. B. Thompson draws attention to this syrup, frequently prescribed in Philadelphia. Inquiry from Prof. Maisch resulted in the information that "Dorvault's l'Officine" (not the French Codex) contains the recipe, under the name of "Sirop de Dentition de Delabarre," with a formula very similar to that in use, as follows:

℞. Juice of fresh tamarinds	3 gm.
Infusion of saffron (strength 3 per cent.)	2 gm.
Purified honey	10 gm.
Tincture of vanilla	25 gm.

Dorvault says, in a note appended, "The juice of tamarinds may be replaced by the pulp diffused in water" (proportions not given), the fresh juice, of course, not being obtainable.

There being, as will be observed, considerable obscurity in regard to proportion of ingredients in the components of the above, something will have to be assumed by individual judgment in working out an acceptable and nice compound.—Amer. Jour. Phar., Dec. 1884, 614–615.

Syrup de Dentition—Formulas.—Among his notes Mr. H. Wilder finds the following formula, credited to Hager (?):

Glycerini	℥j
Chloroformi	gtts. x
Tinct. croci hispan (1:8)	ʒss
Mellis	℥ss M.

This formula is more likely to relieve the itching of the gums than the original. Spanish saffron, by the way, is credited with possessing anodyne (calming) properties. The best way to exhibit the syrup would be to apply it to the gums by smearing, and slightly rubbing them.

Prof. Maisch observes that Hager, in "Phar. Praxis," i, p. 957, gives the following formula: Tinct. croci, 7.5; tinct. ipecacuanhæ, 1.0; syr. rhei, 50.0; syr. liquiritiæ, 50.0 gm. Some add a little vanilla.—Amer. Jour. Phar., Jan. 1885, 20.

TINCTURÆ.

Tinctures—Examination of Deposits.—Mr. R. A. Cripps, in continuation of a former paper on the same subject (see Proceedings) reports on the examination of deposits occurring in the following tinctures:

Tinctura Digitalis.—The pale greyish-green deposit from 1 gallon of tincture barely weighed twenty grains, and contained only slight traces of digitalin.

Tinctura Ferri Acetatis.—The deposit from 1 pint was 33 grains, and contained 76.44 per cent. ferric oxide.

Tinctura Lobelia Æther.—The deposit, as in the case previously recorded, consisted of a fatty body and contained no lobeline.

Tinctura Nucis Vomicæ.—A very suspicious-looking deposit occurring in this was tested for alkaloid, but only faint traces of brucine were found. It amounted to 5 grains from ½ gallon, and consisted mainly of a fatty body, melting at 117°F.—Amer. Jour. Pharm., May, 1885; 243–246; Phar. Jour. and Trans., March 21, 1885, 769.

Tincture of Sanguinaria—Composition of Precipitate.—Mr. Wm. John

McConn has examined the precipitates deposited on the sides and bottom of shop bottles containing tincture of sanguinaria, and found them uniformly to contain alkaloid. Experiments made seem to indicate that the presence of an alkaline citrate prevents this precipitation, and he accordingly advocates the introduction of such as a component of the tincture.—Amer. Jour. Phar., Oct. 1884, 505, 506.

Tincture of Benzoin—Value in the Treatment of Nasal Catarrh.—Dr. W. Brydon confirms the statement made in the "British Medical Journal" (February 28, 1885), to the effect that tincture of benzoin, inhaled through the nostrils repeatedly, is one of the best remedies for nasal catarrh or coryza. He states that in his own experience he found the stuffy feeling in the nostrils, lachrymation and headache to speedily disappear, and that he has tried it with the same success on others.—Phar. Jour. and Trans., May 2, 1885, 890; Brit. Med. Jour., March 28, 1885.

Tincture of Quinine, B. P.—Cause of Variability in Composition.—Mr. Wright records a number of observations and experiments made with a view to determine the cause of mischief in the tincture of quinine of the Brit. Phar. This tincture is made by dissolving sulphate of quinine in tincture of orange peel in the proportion of 8 grains to one fluid ounce (Imp. meas.,) the tincture of orange peel being made from bitter orange peel in the proportion of two ounces (avoir.) to one pint—20 fl. ozs (Imp. meas.) of proof spirit. The author finds that one fluid ounce of proof spirit is incapable of holding 8 grains of sulphate of quinine in solution, the mean of a number of experiments being 5.7 grains. When the officinal quantity (8 grains), is dissolved in the tincture of orange, it may or may not be held in solution, the solubility being in proportion to the amount of calcium salts contained in the tincture of orange-peel. By double decomposition a soluble quinine salt is formed with the organic acid (citric) of the calcium salt, and sulphate of calcium is precipitated out. But if the proportion of calcium salts is small, a greater or less proportion of the undecomposed sulphate of quinine is deposited and subsequently filtered out. The strength of tincture of quinine is therefore left to chance, i. e. the variability in the quantity of calcium extracts in the tincture of orange. The author therefore suggests the employment of the hydrochlorate of quinine, which being perfectly soluble in the proportions required, leaves it a matter of indifference what proportion of calcium salts are contained in the tincture. The author has examined a large number of trade samples of both tincture of orange and tincture of quinine, and gives the results in the form of a table. All of the samples of tincture of orange have an acid reaction, a few being described as faintly acid, and about an equal proportion of the others as slightly acid and acid. The tincture of quinine, when properly prepared, is neutral, and was so found in a majority of 44 samples examined; in most cases also it was of proper strength, but in a few cases it was quite deficient.

In some cases it was slightly acid, in some cases acid, and in others very acid. In one case it contained cinchonidine instead of quinine.—Year-book of Phar., 1884, 537-544.

Tincture of Rhubarb and Magnesia—Formula.—Mr. A. F. W. Neynater, Sr., recommends the following as an efficient preparation: Calcined magnesia, 2 ounces; acetic acid, a sufficient quantity. Evaporate to 5 fluidounces and 5 fluidrachms. Add ext. rhubarb, 2 fluidounces; fluid ext. cardamom, 3 fluidrachms; alcohol, 8 fluidounces. Mix.—Amer. Jour. Pharm., Sept. 1884, 471.

Tincture of Iodine—Use as a Blowpipe Reagent.—Tincture of iodine is proposed as a new blow-pipe reagent by Wheeler and Ludeking, who find it to take the place of hydriodic acid, recommended by E. Haanel. In place of the ordinarily used charcoal they recommend discs made of plaster of Paris. The substance to be examined is placed on one end of the disc, moistened with the tincture, and then heated with the blue flame; the volatilized iodides settle on the cooler part of the disc. The metals are distinguished by the following colors: arsenic, orange-red; lead, chrome yellow; tin, orange-brown; silver, pale grayish yellow when cold, and light yellow when hot; antimony, orange-red; mercury, yellow, soon changing to scarlet; selenium, reddish-brown; bismuth, chocolate-brown, with red border on the side nearest the substance examined; cobalt, greenish brown, with green border (the brownish hue soon changes to light-green, especially when blown upon); molybdenum, deep ultramarine blue near the heated spot; tungsten, pale greenish-yellow near the heated spot; copper, white; cadmium, white, turning bright golden yellow when vapor of sulphide of ammonium is blown over it; zinc, white, disappearing soon.

If a drop of a solution of ammonia be added to, or if ammoniacal vapor be blown upon the velvety chocolate-brown mass produced by bismuth, the color changes from brown to bright red.

Many of the colors soon vanish. By this method tin and zinc can be distinguished by means of the blow-pipe. The reaction of molybdenum is distinct and characteristic.—Amer. Jour. Phar., June 1885, 293; Chemiker Zeitung.

Decolorized Tincture of Iodine—Modification of Process of Preparation.—Mr. R. Rother, after giving numerous reasons for suggesting a change in the formula for this preparation, offers the following:

Iodine	1 troy ounce.
Sodium Sulphite,	
Ammonium Carbonate,	
Alcohol	of each sufficient.
Water	2 fluid ounces.

Upon one troy ounce of sodium sulphite, and 200 grains of ammonium carbonate, each previously powdered, pour the water, and then gradually add the iodine until its color is no longer discharged. If now the effervescence has ceased, add ammonium carbonate in proportion to the remaining iodine; but if ammonium carbonate still predominates, then add sodium sulphite in proportion to the surplus of iodine, and continue the incorporation of the iodine until all has been added, and a faintly yellow solution results, whilst some sulphite and carbonate remain in excess. Now gradually add alcohol with constant stirring until the mixture measures 12 fluidounces. Pour this upon a muslin strainer, press the liquid out, and measure it. Mix the solid residue with enough alcohol to make the measure of a pint when united with the first expression, then press the liquor out, mix it with that first obtained, and filter the tincture through paper.—Amer. Drug., Sept. 1884, 163, 164.

Canthardin Ether—Formula.—E. Dieterich recommends the following as more effectual than cantharidal ether (made from cantharides): Dissolve 2 gm. each of cantharidin and extract of cannabis in 996 gms. ether.—Amer. Jour. Pharm., May 1885, 239; Pharm. Centralh. 1885.

Phosporated Ether.—E. Dieterich recommends the following efficient formula: Melt 5 phosphorus in 5 glycerin; add gradually 10 pulverized charcoal; mix well, then add 1,000 ether. Shake for half an hour; repeat this four or five times during the day, and lastly filter, adding sufficient ether to make 1,000 parts of filtrate.—Amer. Jour. Pharm., May 1885, 239; Pharm. Centralh. 1885.

Sydenham's Laudanum—Modification of Process.—In a paper published by Mr. Ed. Daenen ("Jour. de Phar. d'Anvers," 1872) it was shown:

1. That the tannin of the cinnamon and cloves precipitates a portion of the opium alkaloids; 2, that Chinese cinnamon and cassia lignea are richer in tannin than Ceylon cinnamon; 3, that if cinnamon be used for this laudanum, Ceylon cinnamon should be carefully selected; 4, that in replacing the cinnamon and cloves by their volatile oils, the laudanum thus prepared has all the essential properties of that medicine without the inconveniences produced by the ingredients named; 5, that the employment of assayed opium or extract of opium is indispensable in order to have in all pharmacies the preparation of as nearly uniform strength as possible.

The author's observations since then confirm him in the above conclusions, and he now proposes a modification of the formula which consists in substituting 20 drops each of the oils of cinnamon and of cloves, for 9 grams of cinnamon and of cloves, directed for 1,000 parts of the laudanum. Thereby the active principles of the medicament are preserved, the loss of a notable portion of the product during the process of preparation is avoided, and the composition is not sensibly altered on keeping, since scarcely any precipitate is formed. Amer. Jour. Pharm., Sept. 1884, 473-475.

Vinum Iodatum—Formula.—This is a preparation highly praised by M. H. Barnouvin. Any wine of but small percentage of tannin may be employed. The proportions are 0.4 to 0.5 gm. iodine, dissolved in a small quantity of alcohol, and wine *q. s.* to make one liter.—Amer. Jour. Pharm., May 1885, 241; L'Union Pharm., February 1885.

MISCELLANEOUS FORMULÆ.

Iodinized Paraffin Oil—Use in Lieu of Tincture of Iodine.—This is recommended by C. Jehn, who states that paraffin oil dissolves iodine with a splendid deep violet color; the strength of the solution is stated to be 5 per cent.; a 10 per cent. solution cannot be effected, except by dissolving the iodine in absolute ether and diluting with paraffin oil to the strength desired.—Amer. Jour. Phar., May 1885, 238; Arch. Pharm. Chemiker Ztg., No. 16, 1885.

Canquoin's Paste—Formula.—The following formula, from "St. Louis Druggist," is taken from Amer. Drug., October 1884, 184:

Fused chloride of zinc	10 parts.
Alcohol	2 "
Wheat flour	15 "

Rub the chloride of zinc to a fine powder, and make a paste with the alcohol; then add the wheat flour, using strong pressure with the pestle. When the paste is homogeneous, spread with a roller into sheets about one-eighth of an inch thick, and after a few hours' exposure, preserve in a well-corked bottle.

Tooth Paste—Formula.—Dr. A. W. Harlan recommends the following formula for a tooth paste, which is to be used before retiring and after breakfast, on a brush not dipped in water, and not too stiff: Take of precipitated chalk, powdered orris root, of each 2 ozs.; white castile soap, powdered borax. of each ½ oz.; powdered myrrh, 2 drachms; honey and glycerin, q. s. to make a soft paste. Color rose pink. Perfume to suit.—Amer. Jour. Phar., January 1885, 37; from Dent. Cosmos, September 1884.

Antiseptic Mouth-wash—Magitot's Formula.—This is as follows:

Borate of sodium	15 grains.
Thymol	8 "
Distilled water	1 pint.

The mouth wash not only removes fœtor of breath, but lessens sensitiveness of the teeth.—Amer. Drug., April 1885, 77.

Antibacteride—A New Antiseptic Compound.—C. Aschmann makes a new antiseptic compound, which he names "antibacteride," by heating 338 parts borax with 198 glucose, in the presence of a small amount of water. When the fusion is complete, 124 parts boric acid is added, whilst constantly stirring, until dissolved, and the liquor is evaporated at a gentle heat until it solidifies when run on a cold plate. The resulting mass is soft and translucent, forming an antiseptic suitable for the preservation of provisions. Its composition is represented by the formula $C_6H_{12}O_6Na_2B_4O_7,3H_3BO_3$.—Amer. Jour. Phar., Nov. 1884, 597; Dingl. Polyt. Jour., 143, 251.

Aseptol—A New Germicide.—A phenol compound, termed orthoxyphenylsulphurous acid, has been recently introduced into therapeutics under the name of "aseptol," this title having been given to it on account of its remarkable germicide qualities, which excel those of carbolic and salicylic acids. Aseptol is an amber-colored fluid, of a density 1,400; it has a slight odor, but is more pleasant to the smell and is less poisonous than carbolic acid. Last November Drs. Leroy and Van Den Shrieck, of Antwerp, studied the therapeutic applications of aseptol, and reported most satisfactory results as an antiseptic. It has the following advantages over antiseptics in common use:

1. It is very soluble in water.
2. It is very slightly caustic.
3. It is free from irritative qualities, and may be applied for a long time to the skin, the eyes, the bladder, etc.
4. Finally, its slight toxicity, which permits its use internally in considerable doses, and also the application of concentrated solutions in diphtheritic pharyngitis and laryngitis.—Amer. Jour. Phar., Dec. 1884, 647; from La France Médicale; Med. Times, Nov 1, 1884.

Antiseptic Gauze—Preparation.—Plevani gives the following method for preparing antiseptic gauze:

Two hundred parts of Burgundy pitch and 100 parts of stearin are dissolved in 2,000 parts of alcohol, and 180 parts of carbolic acid added. This quantity, in *grammes*, is sufficient to impregnate 80 metres (87 yards) of gauze. The latter is first laid into square piles, pressed into a zinc trough, heated for several hours in a steam-bath, and then impregnated with the mixture. After having remained a few hours longer in the warm trough, it is pressed. A few minutes' exposure to the air is sufficient to dry it enough to enable it to be rolled and wrapped in parchment paper.—Amer. Drug., Dec. 1884, 235.

Absorbent Cotton—Improved Process.—E. Poulsson modifies Slocum's process (Proceedings 1881, 108) as follows: 1 kilogram cotton is boiled for half an hour in four litres of water, containing 25 grams caustic potassa, and then well washed till every trace of alkali has been removed. It is squeezed quite dry, and put for 15 to 20 minutes in a 5 per cent. solution of chlorinated lime. After washing with a little water (not too much), the cotton is dipped into water acidulated with muriatic acid (about 30 grams diluted muriatic acid to 4 liters water), rinsed in fresh water, and boiled again in alkaline water of the above-mentioned strength. After washing, it is dipped into the acid solution and rinsed perfectly.—Amer. Jour. Pharm., Nov. 1884, 574; from Farm. Tidscrift.

Cake White (Face Powder)—*Preparation.*—Oxide of zinc 4, rice starch 4, white French chalk 4, calcined plaster of Paris 1; rub well together, and mix with sufficient water to suitable consistence so that it can be poured out into boxes or paper moulds (if in moulds, cut to proper size and shape after 5 to 10 minutes).—Amer. Jour. Pharm., Jan. 1885, 24; from Pharm. Zeit. Russl., xxii, p. 6.

Ribbon Ink—Formula.—The "Scientific American" gives the following formula for ribbon ink, such as is used on the type-writers:

Anilin black	½ oz.
Alcohol	15 ozs.
Concentrated glycerin	15 ozs.

Dissolve the anilin black in the alcohol, and add the glycerin.

—Amer. Drug., April 1885, 77.

Turpentine Polish—Formula.—A correspondent of "Amer. Druggist" (Nov. 1884, 217) sends the following formula, which, he says, is easily prepared, and works well:

Alcohol.	4 ozs.
Turpentine	2 ozs.
Damar varnish	1 oz.
Linseed oil (raw)	8 ozs.
Acetic acid	1 oz.

Shoe Blacking—New Formula.—The following formula is said to produce a blacking that gives an excellent polish, and keeps the leather smooth and soft: Mix 100 bone black, 50 glycerin, 5 oil, and 10 parts of vinegar.—Amer. Jour. Pharm., April 1885, 174; Chem. Ztg. 1885, No. 14, 254.

Rat Poison—Preparation from Squill.—The following is given in "Pharm. Ztg." (1885, 6). Melt in a suitable dish 4 ounces of lard, add 8 ounces of squill, and a small onion cut into minute pieces, digest, with continuous stirring for about fifteen minutes, and then mix with an equal quantity of mashed potatoes. When cool, add 20 drops of oil of anise. This paste is said to be very efficient.—Amer. Jour. Pharm., April 1885, 171.

MATERIA MEDICA.

A. VEGETABLE DRUGS.

GENERAL SUBJECTS.

Medicinal Plants Used by the Cree Indians, Hudson's Bay Territory.—Mr. Walton Haydon, who has resided for some time in the Hudson's Bay Territory, recently presented to the Pharmaceutical Society of Great Britain a series of specimens of the drugs used by the native Indians, and with them has also contributed some information concerning their uses, which may be of interest in the future if placed on record. Only the native name of some of the drugs is known at present, but Mr. Hayden has promised to forward specimens of the plants from which they are obtained on his return to Hudson's Bay.

The remainder has been identified by Mr. E. M. Holmes, who gives a description of the following drugs received :

Tow-e-men-artic.—(Fire root, or Bitter Pepper root). The rhizome of *Acorus Calamus.*

Wayakash—The liber of the bark of *Abies balsamea.*

Wakinakim.—The bark of *Juniperus communis.*

Milawapamule.—The bark of *Cornus sericea.*—L'Herit.

Nepatihe.—The bark of *Alnus viridis*, D. C.

Metoos.—The bark of a species of *Populus.*

Wetchus-y-usk-wa (Service Tree).—The bark of the thin branches of a species of *Pyrus.*

We-suk-a-pup (Bitter Tea).—The twigs, leaves and flowers of *Kalmia angustifolia*, L.

Karkar-pukua (Country Tea).—The flowering tops of *Ledum latifolium*, L.

Besides the above, *Betula alba*, *Prunus virginiana*, *Apocynum hypericifolium*, Ait., *Comandra livida*, Rich., *Prunella vulgaris*, *Lobelia*, and *Iris versicolor*, are mentioned as remedies used by these Indians, who appear to use remarkable judgment in the choice of remedies.—Amer. Jour. Pharm., Dec. 1884, 617–621; from Phar. Jour. and Trans., Oct. 1884, 302.

Brazilian Drugs. — Mr. Gustav Peckolt, son of the well-known botanist, Dr. Theodore Peckolt, gives a concise description of the Brazilian drugs and their uses, that were exhibited in Vienna. The drugs described embrace the following :

Carguega Amargosa.—The leaves of *Baccharis genistelloides.*

Jaborandi.

Jurumbeba—The leaves and unripe fruit of *Solanum insidiosum*, Mart.

Mangueira.—The flowers of *Mangifera indica*, L.

Rosa de Caboclo.—The freshly expressed juice of the Indian rose plant, *Langsdorffia hypogœa*, Mart.

Cipó de Chumbo.—The expressed juice of *Cuscuta racemosa*, Mart.

Castanha de cera.—The leaves and seeds of a species of *Pachira.*

Crua or *Melao do Baboclo.*—The fruit of *Sicana odorifera*, Naud.

Fava contra.—The seeds of *Canavalia gladiata*, D. C.

Fructo de Abutua.—*Abuta rufescens*, Aubl.

Fructo de Arradiabo.—Cuidoscalus neglectus, Pohl.

Fructos de Barbatimao.—Stryphnodendron polyphyllum, Mart.

Frutos de Almecega.—Protium heptaphyllum, B. *brasiliense*, Engl.

Fructos de Buchuiha—Luffa operculata, Cogn.

Fructos de Copaiba.—Copaifera nitida, Mart.

Fructo de Cujeté.—Crescentia Cujete, L.

Jaca.—The seed of *Thevetia neriifolia*, Jues.

Fructo de Papagaio.—The fruit of a species of *Mahonia*.

Fructo de Peroba.—Aspidosperma Peroba, Fr. Allen.

Laranjas de Mato.—Gardenia suaveoleus, Vell.

Baunilha de Rio.—The pods of *Vanilla palmarum*, Lindl.

Casca de Angrio Vermelho.—The bark of *Piptoedenia gidd*, Benth.

Casca de Barbatimao.--The bark of *Stryphnodendron polyphyllum*, Mart.

Casca de Cedro Vermelho.—The bark of *Cedrela vellosiana*, Roem.

Casca de Raiz de Cipo Suma.—The root bark of *Anchietea salutaris*, St. Hil.

Casca de Guaranhem.—The bark of *Lucuma glycyphloeum*, Eichl.

Casca de Mulungu.—The bark of *Erythrina Mulungu*, Benth.

Casca Paratudo.—The bark of *Hortia arborea*, Engl.

Casca de Pao Pereira.—The bark of *Geissospermum Vellosi*, Fr. Allen.

Casca de Sangue de Drago.--The bark of *Croton erythœma*, Mart.

Casca de Raiz Timbo.— The root bark of *Lonchocarpus Peckoltii*, Waura.

Casca de Tinguaciba.—The bark of *Xanthoxylum Tinguassiba*, St. Hil.

Quina de Remijio.—The root bark of *Remijia ferruginea*, Ol.

Raiz de Azedinha Grama.—The root of *Oxalis violacea*, Vell.

Ràiz de Columba de Brasil.—The root of *Simaruba salubris*, Engl.

Raiz de Jaborandi de Rio.—The root of *Artanthe Mollicoma*, Miq.—Amer. Jour. Phar., December 1884, 621–628; from Phar. Jour. and Trans., October 1884, 327.

FUNGI.

Ergot—Active Components.—Dr. R. Kobert finds in ergot three physiologically active bodies—two acids and one base.

I. *Ergotic Acid*, being the principal constituent of the sclerotic acid of Dragendorff and Podwyssotzki. Its isolation depends upon its being precipitated by ammoniacal subacetate of lead.

II. *Sphacelic Acid* (from the old name of ergot, Sphacelia segetum). Its isolation depends upon the insolubility of the free acid in water, and its solubility in alcohol.

III. The alkaloid *Cornutine* is not identical with the crystallized nor with the amorphous ergotinine of Tanret; it is readily soluble in alcohol, and is obtained from an alkaline aqueous solution by agitation with ether. This alkaloid is reported as being very poisonous.—Amer. Jour. Phar., April 1885, 170–171; from Pharm. Centralhalle, 1884, 607.

Ergot—Active Principles.—Mr. Tanret criticises the statements made by Dr. Kobert, with regard to the active principles of ergot named ergotinic acid, sphacelinic acid and cornutine. Mr. Tanret considers Dr. Kobert's cornutine is only ergotinine more or less altered by the action of the air and acid, since an acidulated solution of ergotinine exposed to the atmosphere soon becomes colored and produces a liquid possessing the properties claimed for cornutine. He quotes the experiments of Mr. Dujardin-Beaumetz, Dr. Budin and Mr. Chabhazian to prove that ergotinine is not inactive, as Dr. Kobert assumes, but is a powerful medicinal agent.—Phar. Jour. and Trans., May 2, 1885, 889; Jour. de Phar. et de Chim., 1885, 399.

Ergot—Distinction of Fresh from Old.—Koster recommends macerating for some time 2 gm. of the powder with 5 cc. ether. The resulting solution will be colorless if the ergot is fresh, but yellowish if old.—Arch. d. Pharm.

Bernbeck, in "Phar. Ztg.," remarks that this solution should be neutral, and that the oil of old ergot is rancid, therefore giving a more or less acid reaction.—Amer. Jour. Pharm., May 1885, 241.

Mushrooms—Fallacy of a Popular Test to Determine the Absence of the Poisonous Kinds.—Mr. J. L. A. Creuse draws attention to a serious case of poisoning by mushrooms, which had been cooked together with a silver coin, in the belief that if the silver remained unaffected, the mushrooms were of the edible variety. The silver remained unaffected, but the person partaking of the mushrooms died.—Amer. Drug. Circ., Dec. 1884, 179.

Mylitta Australis (Native Bread)—*Characters, etc.*—Mr. A. P. Miller, local secretary of the British Pharmaceutical Conference in Tasmania, has presented to that body a specimen of "Native bread," which is described by Mr. William Southall, his paper being accompanied by the illustration of a transverse section of the young plant. It is very heavy, and in taste resembles boiled rice, cooking making little change in its character. It has a hard outer covering; within are regular pits, generally hexagonal, composed of a white, opaque and somewhat corky substance; the pits are filled with a semi-transparent pulp of a watery-white, having somewhat the appearance of melted wax, and soft enough to spread under a spatula. Observed under a microscope, the two constituent substances of the fungus appear to be both formed of long twisted filaments thickly set and branched; those in the waxy matter, destined to harden without losing transparency, are finer than the others. Some of the specimens are regularly rounded, the black bark being rugous and adherent; others are extremely misshapen, and seeming shaken with age are much lighter. The present specimen is of the former kind, weighing, it is stated, thirty-nine pounds.

The plant is catalogued in Hooker's "Botany of the Voyage of the Beagle," where it is described under the name *Mylitta australis*, Berkeley, as having an indented peridium or outer covering, whilst the interior of the compact mass is dry, sub-horny, containing heterogeneous veins. Recent specimens of this Australian plant, which is used as an article of food, exhibit something like asci. There can be but little doubt that the plant is autonomous, meaning that it has an independent existence. Mr. Berkeley mentions that on dry open hills it is to be detected by the ground turning upwards with something underneath, which is this fungus. Mr. Southall observes that the plant may be considered to be the mycelium or the sclerotioid mycelium of a fungus of which the other stages of growth have never yet been observed.—Yearbook of Pharmacy, 1884, 524–527.

GRAMINACEAE.

Barley.—Analysis—Mr. Frank X. Moerk, after giving the details of his analysis of Canada barley, sums up his results as follows:

		Calculated as free from moisture.
Moisture	11.68	. .
Ash	2.68	3.03
Proteids	12.90	14.70
Fat, Resin, etc.	5.65	6.39
Volatile Oil	0.69	0.78
Cane-sugar	1.02	1.15
Dextrin	1.85	2.09
Starch	56.64	64.13
Cellulose	7.20	8.15
	100.40	100.42

—Amer. Jour. Pharm., July 1884, 366–370.

Malt—Analysis.—In continuation of his analysis of barley (see Proceedings 1884, 124) Mr. Frank X. Moerk has malted some of the same lot of barley, and subjected it to analysis, a detailed description of which is given. The following was found to be the percentage composition:

		Calculated as free from moisture.
Moisture	10.56	. .
Ash	2.38	2.66
Proteids	11.82	13.21
Fats, Resins, etc	5.60	6.26
Cane-sugar	1.54	1.72
Maltose	1.52	1.70
Dextrin	3.51	3.92
Starch	55.56	62.12
Cellulose	7.72	8.63

The author, furthermore, subjected the barley, during the different stages of the malting process, to examination, confining his experiments, however, to the determination of sp. gr., moisture, maltose and dextrine. It had been his intention, originally, to determine the increase of diastase at the different stages, but after numerous experiments on the action of diastase upon gelatinized starch, the idea had to be abandoned for the reason that diastase, no matter how carefully prepared, could not compare in its action on gelatinized starch with the equivalent amount of malt, and therefore no basis for working could be make.

The author's results are as follows:

Sample.	Specific Gravity.	Moisture, per cent.	Draff, per cent.	Maltose, per cent.	Dextrin, per cent.
Barley.					
Steep	1.0206	11.34	39.650	22.065	15.560
Couch	1.0213	11.65	38.100	23.570	15.900
1 day on floor	1.0223	11.16	37.700	25.155	16.495
2 days on floor	1.0231	10.96	37.050	27.795	15.570
3 " "	1.0241	10.38	36.500	30.910	14.330
4 " "	1.0247	10.60	33.650	36.190	11.155
5 " "	1.0250	10.16	32.250	40.785	8.565
6 " "	1.0257	10.52	28.500	41.675	10.510
7 " "	1.0260	10.20	27.935	42.535	12.380
8 " "	1.0264	10.26	26.215	43.535	14.965
Kiln-dried	1.0271	10.56	25.900	44.885	13.575

—Amer. Jour. Pharm., Sept. 1884, 465–470.

Stigmata Maidis—Proximate Examination.—Mr. John M. Hillan found fresh corn silk to contain 83.3 per cent. of moisture, and the well-dried drug to re-absorb water from the atmosphere quite readily. Dry corn silk yielded 12.5 per cent. of ash containing carbonates, chlorides, phosphates and sulphates of potassium, magnesium and calcium, alumina and silica. Benzol extracted 2 per cent., the extract having a brown color and containing fixed oil and resin. Alcohol of 80 per cent. yielded 26.05 per cent. of extract, containing tannin and chlorophyll, and water subsequently dis. 2.25 per cent. of extractive. Sugar was found in green, but not in dried corn silk. Distillation with water did not yield a volatile oil; on distilling with potassa, an alkaline liquid was obtained, which on being evaporated with acetic acid yielded crystals, and the solution of which was precipitated by iodine and by Mayer's solution.—Amer. Jour. Phar., November 1884, 571.

LILIACEÆ.

Aloes—Quantitative—Determination.—According to H. Hager, aloes is soluble in a cold solution of carbonate of sodium, easily soluble in a 2 per cent. solution of ammonia, entirely so in 80 per cent. alcohol, incompletely in 90 per cent. and absolute alcohol, insoluble in a mixture of 1 vol. of absolute alcohol, 2 vol. of chloroform, and 3 vol. of benzol. To determine aloes in a liquid, evaporate, dry and powder; exhaust at a temperature of 18° to 25°C. with the mixture of alcohol, chloroform and benzol, to separate all the resinous substances soluble in that mixture, and dry the residue; digest this with 80 per cent. alcohol at a temperature near 50° C, frequently shaking; place the resulting solution in a weighed capsule, evaporate and dry. For each gram of the residue use 12 to 15 cc. of a 2 per cent. solution of ammonia, to dissolve the aloes; treat the resulting solution with a very slight excess of a solution of acetate of lead, and restore a slight ammoniacal smell by adding a few drops of ammonia water. Following these directions, the aloes is entirely precipitated as a lead compound. Collect this precipitate, wash with a little distilled water, and dry in a warm place. 1 gm. aloes giving about 2.35 gm. of the lead compound, multiply the weight of the latter by 0.4256; the result gives approximately the amount of aloes.

To determine the aloes, as such, mix the lead compound with an equal weight of sulphate of ammonium, moisten with water on a shallow plate, kept in a warm place; repeat moistening and drying, to get rid of ammonia, and extract the dry mass with warm 80 per cent. alcohol; the residue yielded from the latter solution, increased by 12 per cent., gives the amount of aloes of the original mixture.—Amer. Jour. Pharm., May, 1885, 237, 238, Phar. Centralh., No. 12, 1885.

Aloes—Detection in Pharmaceutical Preparations.—Messrs. R. A. Cripps and T. S. Dymond, in view of the unsatisfactory state of the detection of aloes, have undertaken a series of investigations, which lead them to recommend the following method: Place 1 grain of the substance in a glass mortar standing on white paper; add now 16 drops of strong sulphuric acid, and triturate till the whole is dissolved; then add 4 drops of nitric acid, sp. gr. 1.42, and lastly, 1 ounce of distilled water. If aloes be present, a color varying from deep orange to crimson will be produced, according to the kind of aloes employed. To confirm, add ammonia, when the color is deepened, usually to a deep claret. This test was first applied to the same series of specimens as Bornträger's and Klunge's tests were applied to, and, without exception, was found to give good results; in fact, not only was the presence of aloes detected, but a fair indication of the kind of aloes was given, the varieties of Barbadoes, true Socotrine and Natal producing a crimson, while hepatic and Cape only gave a deep orange-red. The authors also used for comparison the test with sulphuric acid and vapor of nitric acid, which produces with certain aloes a play of colors passing through green, blue and violet to crimson; their results are shown in the following table:

Variety of Aloes.	Bornträger's Test.	Klunge's Test.	H_2SO_4 and vapor of HNO_3.	Cripps and Dymond's Test.	Cripps and Dymond's Test with Ammonia.
Barbadoes.	Pale rose color.	Deep red.	Faint blue color.	Crimson.	Deep claret
Natal.	Very faint pink.	Faint red.	Deep blue color.	Deep crimson.	Intense brownish-red.
Curaçoa.	Fine rose color.	Deep red.	Faint blue color.	Crimson.	Intense claret.
Hepatic	Faint color after 24 hours.	Nil.	Nil.	Orange-red.	Claret.
Hepatic (Indian).	Faint color after 24 hours.	Nil.	Nil.	Orange red.	Pale claret.
Cape.	Faint color after 24 hours.	Nil.	Nil.	Orange-red.	Pale claret.
Socotrine (true).	Pale rose color.	Faint red.	Very faint blue color.	Pale crimson.	Deep claret.
Socotrine (commercial), three samples.	Pale rose color after 24 hours.	Nil.	Nil.	Orange-red.	Claret.
Socotrine (Mocha or Zanzibar)	Pale rose color.	Red.	Faint blue color.	Crimson.	Deep claret.
Aloes juice (Natal).	Pale brownish pink.			Crimson.	Intense brownish-red.

Having thus proved that the test is applicable to any variety of aloes, it remained to be determined whether the presence of aloes in complex mixtures could be proved, and also whether any other substance will give the same reaction. With this object they have carefully examined a very large number of preparations, first those which were known to contain aloes, then other extracts, etc. The following table shows the results:

Name of Preparation.	Cripps and Dymond's test.	Cripps and Dymond's test with AmHO.
Barbaloin	Purplish-red	Red.
Jafferabad aloin	Purplish-red	Red.
Ext. aloes barb	Crimson	Red.
Ext. aloes socot	Crimson	Red.
Dec. aloes comp.	Orange-red	Red.
Vin. aloes	Orange-red	Red.
Tinc. aloes	Orange-red	Red.
Pil. aloes barb.	Crimson	Red.
Pil. aloes socot (1)	Pale crimson	Red.
Pil. aloes socot (2)	Orange-red.	Red.
Pil. aloes et assaf. (1)	Pale-crimson	Red.

Name of Preparation.	Cripps and Dymond's test.	Cripps and Dymond's test with AmHO.
Pil. aloes et assaf. (2)	Orange-red	Red.
Pil. aloes et ferri	Crimson	Red.
Pil. aloes et myrrh	Orange	Red.
Pil. coloc. comp.	Crimson	Red.
Pil. coloc. c. hyos	Orange-red	Red.
Pil. cambog. comp.	Orange-red	Red.
Pil. rhei comp.	Crimson	Red.
Pil. ipecac c. scillâ	Pale-yellow	Yellow.
Pil. saponis comp.	Yellow	Yellow.
Pulv. sennæ	Orange-red	Red.
Ext. aconiti	Yellow	Yellow.
Ext. bellad	Yellow	Yellow.
Ext. colchici	Pale-yellow	Pale orange.
Ext. coloc. simp	Pale yellow	Yellow.
Ext. coloc. comp.	Orange-red	Red.
Ext. conii	Brownish-yellow	Yellow.
Ext. frangulæ	Orange -red	Red.
Ext. gentianæ	Pale yellow	Yellow.
Ext. jalapæ	Pale yellow	Yellow.
Ext. lupuli.	Orange-yellow	Yellow.
Ext. nucis vom..	Orange	Yellow.
Ext. opii	Orange	Orange.
Ext. quassiæ	Deep-yellow	Yellow.
Ext. rhei.	Orange-red	Red.
Ext. taraxaci	Pale yellow	Yellow.
Fel. bovin. purif.	Yellow	Yellow.
Rad. rhei	Orange-red	Red.
Salicin	Pale-yellow	Nearly colorless.
Croci stig	Yellowish	Yellow.
Acid, chrysophanic	Deep orange	Red.
Resin. scammon	Pale yellow	Yellow.

From the above table it will be seen that though the presence of aloes never fails to make itself manifest, rhubarb and substances containing chrysophanic acid behave in a similar way; but a nearly colorless aqueous solution of aloes does not become pink when ammonia is added, as is the case with solutions of substances containing chrysophanic acid, and in this way aloes may be distinguished. To this rule senna is the only exception.—Amer. Jour. Pharm., March 1885, 142–145; from Pharm. Jour. and Trans., Feb. 7, 1885, 633.

Fossil Aloe.—Mr. G. A. Keyworth draws attention to and describes "fossil aloe," which is found in the shingle which lies beneath the cliffs of Hastings, England. The nearest living representative is the great American aloe. See Year-book of Pharm., 1884, 494–499.

Convallaria Majalis — Therapeutic Value.— Leubascher affirms that grain $\frac{1}{7}$ of convallarin produces paralysis and loss of reflex activity in frogs, and in animals a progressive fall of arterial pressure, with slowing of the pulse and final diastolic arrest of the heart. Pel. Leyden and Stiller agree with Leubascher in finding no therapeutic utility in its employment. Prof. E. T. Bruen, in our own country, says that it can be employed with reasonable confidence in functional cardiac disorders and in mitral obstruction, and that, in comparison with digitalis, it acts more as a cardiac regulator, but much less as a cardiac stimulant.—Amer. Jour. Pharm., May 1885, 266; Therapeutic Gazette; Pacif. Med. and Surg. Jour., April 1, 1885.

BROMELIACEÆ.

Pineapples.—Occurrence of *Mannitol,* which see under "Organic Chemistry."

DIOSCOREACEÆ.

Tamus Communis—Poisoning by the Berries.—A case of poisoning by the berries of the black bryony, which lately happened in France, has served to direct attention to the poisonous character of the scarlet berries of this plant. The symptoms produced in a child twenty-seven months old were colic and vomiting. The physiological action of the plant being but little known, Mr. H. Coutagne tried the effect of an alcoholic tincture of the berries on frogs and guinea pigs, in which it speedily produced paralysis and convulsions. Seventeen of the berries given to a dog caused uncertainty of gait and a partial paralysis of the hind-quarters lasting several days. The seeds of the black bryony are hard and spherical, whilst those of the white bryony are oval and flattened.—Rep. de Pharm., Nov. 1884, 519; Phar. Jour. and Trans., Dec. 27, 1884, 504.

IRIDACEÆ.

Iris Versicolor—Constituents.—The oleo-resin prepared by Wm. L. Cliffe, yielded to acidulated water a brownish amorphous substance, which, after the separation of the acid, was soluble in ether, alcohol and water, the latter solution giving precipitates with potassio mercuric iodide and with potassium bromide, while the alcoholic solution, acidulated with nitric acid and tested with phosphomolybdic acid gave a brilliant green color in a day or two. The drug after treatment with benzin, yielded to 80 per cent. alcohol several resins, tannin and sugar. Cold water now took up albumen, and gummy and coloring matter, after which treatment with boiling water yielded a slightly-colored liquid which did not become blue with iodine. The distillate with water separated a solid compound which became liquid at the temperature of the body.—Amer. Jour. Phar., Dec. 1884, 616.

Crocus electus, Gatinais—Constituents.—Mr. R. Kayser, in view of the unsatisfactory investigations of saffron hitherto communicated, has carefully isolated and examined the following constituents:

Essential Oil of Saffron.—This was obtained from saffron by steam distillation in a current of carbonic anhydride. It is an almost colorless mobile liquid, with an intense odor of saffron. When exposed to the air, it becomes oxidized and turns brown and syrupy. Analysis showed its composition to be $C_{10}H_{16}$, so that it belongs to the class of terpenes.

Crocin.—Saffron was first freed from fatty matters, etc., by ether, and then extracted with water at the ordinary temperature. The aqueous solution was shaken up with bone-charcoal, which absorbed nearly all the coloring matter. The charcoal was filtered off, and the crocin extracted from it by washing with pure water. This solution was evaporated to dryness, and the residue treated with 90 per cent. alcohol. On evaporating the alcoholic solution, a yellowish-brown brittle mass is left, which yields a yellow powder. Crocin is easily soluble in water and dilute alcohol, less so in absolute alcohol, and almost insoluble in ether. Strong sulphuric acid dissolves it to a deep blue solution, which turns first violet, then cherry-red, and lastly brown. Nitric acid (sp. gr. 1.4) gives a similarly-colored solution, but the color immediately changes to brown. Hydrochloric acid yields a yellow solution. Lead acetate and lime- and baryta-water give no precipitates, but, on heating, they decompose crocin into crocetin and a sugar. Alkalis cause the same decomposition in the cold. Crocin is thus a glucoside, and analysis shows its composition to be $C_{44}H_{70}O_{28}$.

Crocetin is best obtained by the action of hydrochloric acid on crocin. It is precipitated in the form of yellow flocks, which when dried yield a red powder. It is almost insoluble in pure water, but is rendered soluble by the addition of a small quantity of an alkali. Acids reprecipitate it from such solutions in orange flocks. It is easily soluble in alcohol. An alcoholic solution gives bright red precipitates with lead acetate, and with lime- or baryta-water; the compounds so formed, however, are not definite, but vary in composition. Sulphuric and hydrochloric acids behave with it as with crocin. Its composition is $C_{34}H_{46}O_9$. The decomposition appears to take place according to the equation $2C_{44}H_{70}O_{28} + 7H_2O = C_{34}H_{46}O_9 + 9C_6H_{12}O_6$.

Crocose.—The sugar mentioned above yields rhombic crystals. Its solution has a sweet taste and strong dextro-rotatory action. Its reducing power for Fehling's solution is only half that of dextrose. The quantities of crocetin and crocose obtained by the decomposition agree very closely with those required by the above equation.

Picro-crocin—Saffron-bitter.—This substance crystallizes out in the ether-extracting apparatus if the extraction be continued for a long time. It forms colorless prismatic needles, very sparingly soluble in ether. It dissolves easily in water and alcohol, less so in chloroform. It has a characteristic bitter taste, which is very persistent. It melts at 75° to a colorless liquid. Its formula is $C_{38}H_{66}O_{17}$. Lead acetate, lime-water and baryta-water give no precipitate in the cold, but decomposition takes place on warming, crocose and the terpene described above being formed. Picro-crocin is thus a glucoside like crocin, and the decomposition may be expressed by the equation—

$$C_{38}H_{66}O_{17} + H_2O = 3C_6H_{12}O_6 + 2C_{10}H_{16}.$$

—Amer. Jour. Phar., March 1885, 129–130; from Jour. Chem. Soc., 1885, 59; Ber. d. Deutsch. Ges., 1884, 2228–2234.

AMOMACEÆ.

Jamaica Ginger—Decrease of Production in Jamaica.—The cultivation of ginger upon Jamaica has been greatly diminished. According to the report of Mr. Morris, only 7,036 cwt. (value of £16,000) were exported during the last five years, against 11,219 cwt. (value, £22,000), in the previous five years. The cause is to be ascribed partly to the exhaustion of the soil by rapacious planters, and partly to improper methods of planting.—Amer. Drug., Dec. 1884, 228, from Pharm. Zeit.

Alpinia Officinarum (Hance)—Proximate Analysis of the Rhizome.—Until very recently, all that was known respecting the constituents of galangal rhizome was that the odor was due to a volatile oil, and that it contained a crystalline principle, which had been discovered and imperfectly examined by Brandes. In 1881, Jahns undertook a further examination of Brandes' crystalline body, "Kæmpferid," and found that this was associated with two allied bodies, which he named "galangin" and "alpinin" respectively. (See Proceedings 1882, 448.) Mr. J. C. Thresh, in the course of his study of the pungent principle of galangal, had occasion to ascertain the nature of the other proximate principles, and now records the results of his analysis as follows:

Soluble in petroleum ether:		
Volatile oil	.60	2.33
Resin	.15	
Fat and galargol	1.58	
Soluble in ether:		
Kæmpferid, galangin, alpinin, etc., precip. by lead acetate	1.44	2.62
Crystalline matters not precip. by lead acetate	1.18	
Tannin		.56
Phlobaphene		1.22
Glucose		.98
Oxalic acid		.32
Mucilage, etc.		2.55
Galangal Red		2.80
Starch		23.70
Albuminoids		2.55
Moisture		13.80
Ash		3.85
Cellulose, etc., by difference,		40.72
		100.00

The active principle,

Galangol, is very pungent, and is easily soluble, even in diluted alcohol and in solutions of the fixed alkalies, but does not dissolve in ammonia, and its alcoholic solution is not precipitated by lead acetate and ammonia.—Year-book of Pharmacy, 1884, 570–573.

Hedychium Spicatum—Proximate Analysis.—Mr. John C. Thresh has subjected a quantity of the root of this plant (a native of the Himalayas, found in the Indian bazaars under the name of "Kafur-kachri or "Kapur-kachri," and used by the Hindoos as incense), to proximate examination. On account of the limited supply, the odorous principle, which exists in very minute quantity in the rhizome, could not be obtained in a pure condition, nor subjected to nearer examination. He obtained, however, a considerable quantity of a peculiar crystalline component, which analysis proved to be *Ethylmethyl paracoumarate.* The crystals are colorless, tabular, odorless, soluble in petroleum ether, ether, alcohol, chloroform and benzol. Insoluble in diluted solutions of potash or soda. Soluble without color in sulphuric acid, but becoming purple-red when heated. Neutral in reaction. Melting point (uncorrected) 120°–122°1′. From this compound the author separated *Methyl-paracoumaric* acid identical in character and composition with that prepared by Perkins by the action of acetic anhydride on anisic aldehyd in presence of acetate of sodium. The author sums up the results of the proximate analysis of the rhizome as follows:

Soluble in petroleum ether:		
Ethyl-methyl paracoumarate	3.0	5.9
Fixed oil and odorous body	2.9	
Soluble in alcohol:		
Indif. substance ppt. by tannin Acid resin, etc.		2.7
Soluble in alcohol:		
Glucoside or saccharine matter		1.0
Mucilage		2.8
Albuminoids, organic acid, etc.		1.9
Starch		52.3
Moisture		13.6
Ash		4.6
Cellulose, etc.		15.2
		100.00

—Pharm. Jour. and Trans., Nov. 8, 1884, 361–362.

SARRACENIACEÆ.

Sarracenia Variolaris, Mx.—Medicinal Uses in the South.—Dr. H. H. Rusby draws attention to this plant, known as Spotted Trumpet-leaf, Spotted Pitcher Plant, Spotted Side-saddle Flower, Small-pox Plant, and Hood-topped Fly-catcher. The last name possesses interest as being the first reference in the common names to a peculiarity of this and other species of the genus, which has lately been the subject of special scientific investigation, namely, their carnivorous habits. A narrow line of sugary secretion is deposited on the outside of the pitcher-shaped leaves, running from near the ground up to the edge of, and a little way down into, the cup. Insects ascending and feeding from this viscid line, become intoxicated by the time they have reached the interior, and fall into the fluid contained within the leaf. This fluid contains a substance closely akin to the gastric juice, by means of which certain portions of the insects' bodies are digested. This proteid matter is then absorbed. The only medical virtue heretofore attributed to this genus is that of a small-pox specific, which, as pointed out by Dr. Lyons, is probably on the "absurd theory of signatures." But Dr. Lane, who has reported on this and other southern plants to the author, describes it as a tonic and slightly anodyne, and of use in dysenteries. These properties would seem to accord well with the physiological habits above given. A secreted substance capable of intoxicating insects would be likely to give it "slightly anodyne propties," and its digestive principle would be likely to render it tonic. As to its use in dysenteries, its abundant astringency would render it serviceable in diarrhœas which often assume a dysenteric type, but scarcely in a real dysentery. The same remarks are applicable to the next and other species of Sarracenia.

Sarracenia flava, L., the Yellow-flowered Pitcher-plant, etc., now reported as the "Umbrella-topped Fly-catcher."—Amer. Jour. Pharm., February 1885, 89.

ARISTOLOCHIACEÆ.

Asarum Europæum—Chemical Investigation.—Messrs. Rizza and Butlerow have submitted asaron, the crystalline constituent of the volatile oil of *Asarum Europæum*, to chemical investigation. They find that pure asaron melts at 59°C., boils at 296°C., and in small quantities distils without decomposition. It is sparingly soluble in boiling water, from which it crystallizes on cooling in delicate needles and scales. It is readily soluble in alcohol, ether, tetrachloride of carbon and acetic acid, is odorless when pure, and has only a faint pungent taste. The authors attribute to it the formula $C_{12}H_{16}O_3$.—Pharm. Jour. and Trans., Aug. 2, 1884, 82, from Ber. d Deutsch. Chem. Ges., xvii., 1159.

In a subsequent communication, Professor Poleck confirms the above results practically, but adds that pure asaron has remarkable fluorescent properties, and that ultimate analysis renders the formula $C_8H_{10}O_2$ probable.—Ibid. from Ibid, 1415.

THYMELACEÆ.

Mezereon—Yield of Daphnetin.—Its constitution, etc. See under "Glucosides."

LAURACEÆ.

Laurus Persea—Examination of so-called Mannite from Fruit.—Messrs Muntz and Marcano have examined the so-called mannite found in the avocado fruit, and found that it differs from the mannite of manna. Its fusing point is between 183.5° and 184° C., that of mannite being 164.5°. Its formula is $C_{12}H_{14}O_{12}$. It is very soluble in hot alcohol and hot water, but less so in cold water (6 in 100) and slightly only in cold alcohol. From dulcite, which has the same fusing point, it is distinguished by not yielding mucic acid when oxidized with nitric acid. The authors propose the name of *perséite* for the new substance.—Phar. Jour. and Trans., Aug. 2, 1884, 82; Compt. Rend., xcviii., 38.

Baros Camphor—Production in Johore.—Mr. Peter Macewan describes some specimens of Baros camphor which is remarkable from the fact that it is "found native" in Johore. The extent to which *Dryobalonops aromatica* exists in Johore, and the amount of camphor obtained therefrom, is not known; in fact, according to Mr. Jamie, it is only within the past few years that Johore was known to contain camphor trees, similar to those in Borneo. Mr. Macewan describes four qualities of Baros camphor, which is noteworthy, since in "Pharmacographia" it is stated that it is picked, cleaned and selected into three qualities. Mr. Jamie also states that it is unusual to find four qualities. The *first* quality occurs in transparent crystals, unmixed with woody matter and destitute of color, from 1/6 to 1/4 inch and upwards across, and weighing from 25 to 36 centigrammes. The *second quality* is inferior as to size, and the crystals are generally of a brown color, weighing from 8 to 16 centigrammes. It contains woody tissue, and on treatment with alcohol, leaves 2.8% of residue. The *third quality* is made up of powdery crystals, coherent and slightly colored greyish. It leaves very little insoluble residue, and resembles crude Japanese camphor. The *fourth quality* is brownish, and pulverulent, not unlike seashore sand, not so coherent as the third quality, and contains 2.3% of insoluble matter. The camphor is valued by the natives, and commands an absurdly high price.

Mr. Macewan observes that the statement in "Pharmacographia," that Borneo camphor does not crystallize on the interior of the bottle in which it is kept, is not correct. The bottle containing Mr. Jamie's genuine sample has a well-marked deposit, and in the bottle containing the Johore specimens deposits have commenced, particularly in the third quality. The author also observed a very large deposit in an old specimen in the Edinburgh Museum of Sciences and Arts.—Pharm. Jour. and Trans., March 28, 1885, 795–796.

Referring to the crystallization of "Baros camphor" in the bottle in which it is kept, Mr. John R. Jackson states that ten samples of the camphor contained in the museum at Kew are also characterized by the large deposits in the interior of the bottle, while others have not deposited at all. The ten samples seem to belong to the third quality, as classified by Mr. Macewan, for they are composed of crystals of a greyish color—the one having been in the museum since 1851, the other since 1855.

The superior kinds, white and larger crystals, received at the same time, show no deposit whatever. It would then seem that the most inferior kinds more readily deposit crystals than the better sorts.—Ibid., May 2, 1885, 894.

MYRISTICACEÆ.

Nutmeg—Poisonous Dose.—Dr. J. Dabney Palmer draws attention to the poisonous properties of nutmeg when given in large doses, a property which is not generally understood, though it is mentioned in the National as well as the U. S. Dispensatories. A lady, who had eaten one and a half (about 135 grs.), became drowsy within two hours, remained in almost a stupor for nearly an hour, and then became highly excited. This was followed by pain in the region of the heart, cold extremities, great pallor, and a weak pulse. Two doses of bromide of ammonia were administered, and it was necessary to repeat the dose next morning. The dose of nutmeg should not exceed from 5–20 grs.—Amer. Jour. Pharm., Jan. 1885, 23.

POLYGONACEÆ.

Polygonum Hydropiper—Proximate Analysis.—Messrs. Henry Trimble and Herman I. Schuchard have subjected authentic and properly collected tops and leaves of *Polygonum Hydropiper* to proximate examination, primarily with the view of determining the nature of the pungent principle. They have not succeeded in isolating this principle, and, from their experience, arrive at the conclusion that this principle is decomposed by the slightest heating. A tincture made with diluted alcohol, contained the pungent principle; but on heating it with a view to concentration by distillation, the peculiar pungent taste was entirely lost. The authors also prepared the substance which Dr. C. I. Rademaker had isolated in 1871, and, believing it to be a distinct principle, named it polygonic acid. Following the method of Dr. R., they obtained a substance which they believe to be simply a mixture of tannic and gallic acids, with a small quantity of chlorophyll as impurity. This substance gives all the reactions stated by Dr. R., which reactions are, however, produced also by a mixture of tannic and gallic acids obtained from other sources. The presence of the latter accounts for the crystalline appearance of the so-called polygonic acid.

The following summary shows the amount of the most important constituents:

Water	10.25	From petroleum spirit solution.
Wax	2.70	
Resin and chlorophyll	1.54	From ether solution.
Resin, tannin and chlorophyll	5.14	From alcoholic solution.
Sugar	1.44	From aqueous solution.
Gum	.55	
Tannin and extractive	5.23	

Albuminoids	1.00	From alkali solution.
Phlobaphene, etc	5.95	
Salts and a small amount of extractive	6.00	From dilute acid solution.
Cellulose	57.45	
	97.25	

Separately determined: tannin, 3.46 per cent.; ash, 7.40 per cent.

—Amer. Jour. Pharm., Jan. 1885, 21–23.

Rhubarb—Cultivation, etc., in the Kuku-Nor Mountains.—The "Pharmaceutische Zeitung" quotes from an Austrian writer some particulars of a visit to the rhubarb-growing district in the northern slopes of the Kuku-Nor mountains. The soil is described as consisting of layers of rich earth washed down from the higher regions, and the growth of tbe rhubarb plant as extending from the bottom of the valley up to the limits of the forests, an elevation of about 3,200 meters, and sometimes higher. Not only the Tangutians, but Chinese from Lining-Fu, are here occupied in the industry, the spring-time and autumn being considered the most favorable times of the year for digging up the root, on the ground that the root juices are then more powerful. The plant frequently reaches a height of 3 meters or more, and consists of a stem 3 or 4 centimeters thick, at the base of which are 3 to 10 dark-green, cordate, divided leaves. Above, the stem bears several branches, attaining ½ meter in length, and bearing groups of small white flowers. In this district, the rhubarb plant flowers in July, the seed ripens in August, and in September it is collected, at the same time as the root, by the Tangutians, who also cultivate the plants in the neighborhood of their tents. The root-stock consists of a longish tuber, to which are joined numerous long, slender adventitious roots. The latter are cut off during collection as useless; but the principal stock is dried in the sun and then transported to Lining-fu, the principal market of the drug. On the spot, the root is very cheap, enough being obtainable for a few copper coins to last a family a life-time; but transportation from Lining-fu to Pekin increases its cost twenty-fold.—Amer. Drug., Nov. 1884, 209.

Chinese Rhubarb—Varieties.—Mr. Wm. Elborne, Assistant Lecturer on Materia Medica, Owens College, states that Chinese or East Indian rhubarb consists of two varieties, of which one possesses the characteristic white lattice-work venation with a red grained fracture, while the other possesses a longitudinal ramification of white veins with a black-grained fracture. The first variety is referred by the author to Rheum palmatum, var. tanguticum, from which plant, the author believes, also the highly esteemed extinct Russian and Turkey varieties were obtained. The second variety is yielded by Rh. officinale, and agrees in all essential characters with the roots from this species cultivated by Rufus Usher, of Bodicote.—Amer. Jour. Pharm., May 1885, 249; Phar. Jour. and Trans., Dec. 20, 1884, page 497.

English Rhubarb—Botanical, Microscopic and Chemical Characters.—In a former paper, read before the School of Pharmacy Students' Association (Pharm. Jour. and Trans. (3), xiii., 1046), Mr. William Elborne, with a view to classification, divided the numerous varieties of commercial rhubarb into two groups as follows:

ASIATIC RHUBARBS.

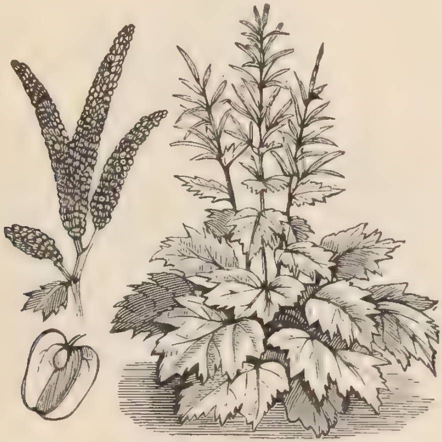
Chinese	Russian, Muscovy, or Turkey Canton or East Indian Bakarian or Dutch trimmed,	yielded by	*Rheum palmatum* var. *Tanguticum*, and *R. officinale ?*
Siberian		"	*R. rhaponticum.*
Himalayan (large),		"	*R. Emodi.*
Himalayan (small),		"	*R. Webbianum.*
Bucharian,		"	*R. undulatum.*

EUROPEAN RHUBARBS.

English,	yielded by	*Rheum rhaponticum.* *R. officinale.*
French,	"	*R. rhaponticum.* *R. compactum.*
Austrian (Moravian)	"	*R. rhaponticum.*

In the present paper, communicated to the British Pharmaceutical Conference, the author gives a full description of the botanical character, cultivation, collection, and microscopic structure, of English cultivated rhubarb derived from *Rheum officinale*. Two varieties appear to be produced by Messrs. Rufus Usher & Sons, who at present are the sole producers, viz: "ordinary cultivated" and "highly cultivated." Both varieties occur in flat concavo-convex pieces, weighing from three to four ounces each. The outer convex surface displays a number of deep longi-

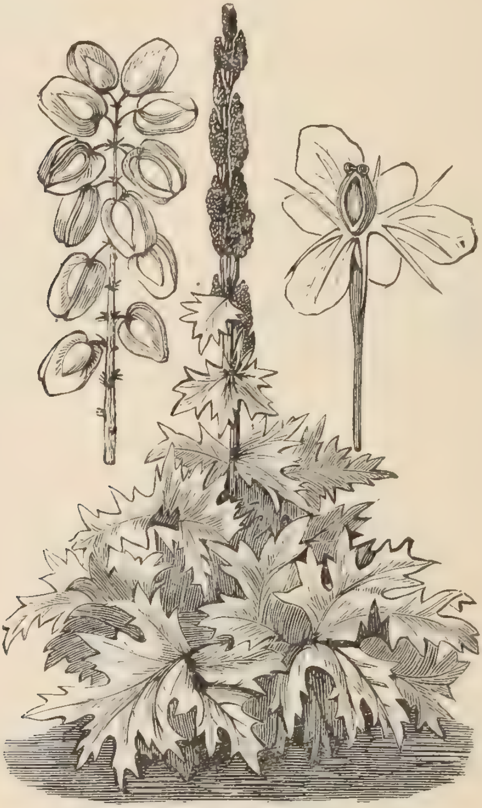
FIG. 30.



R. Officinale.

tudinal furrows, the effect of drying, and is traversed throughout with a longitudinal ramification of conspicuous veins, producing altogether a different appearance to the fine net-veined markings displayed by some samples of the present commercial East Indian rhubarb. In the center of the concave surface of each piece, a small hole has been drilled halfway through, for the purpose of ascertaining the soundness of the pieces internally, and in this feature it corresponds with the now extinct Russian Rhubarb. The pieces show the same stellate markings as the East Indian, especially on the inner surface, much more in some than in others. While the "ordinary" and "highly cultivated" bear a great resemblance to each other externally, the fracture of the former shows a more compact structure, and the internal veins a deeper color; the odor is stronger, and the color of the powdered root is much darker than that of the highly cultivated. Neither variety presents the red appearance displayed by the fracture of *R. rhaponticum* or of the imported drug, nor do they yield the same bright yellow powder as the latter. They are distinctly

FIG. 31.



R. Palmatum.

gritty when chewed. On fracture the comparatively black color of the veins imbedded in a whitish parenchymatous tissue readily distinguishes the cultivated varieties of *R. officinale* from *R. rhaponticum.*

The author has made a comparative determination of cathartic acid, chrysophan and tannin, resinous subtances, and mucilage, in the two varieties of English rhubarb from *R. officinale*, in English green rhubarb from *R. rhaponticum*, and in East Indian rhubarb, and gives his results as follows:

	R. officinale. Ord. cult. Per cent.	*R. officinale.* Highly cult. Per cent.	*R. Rhaponticum.* Per cent.	East Indian Rhubarb. Per cent.
Cathartic acid.	3.5	3.2	3.3	4.5
Chrysophan and Tannin.	14.3	11.7	12.5	11.7
Resinous substances . .	2.6	2.0	3.4	4.6
Mucilage	6.5	4.8	4.1	4.0

The results show that the composition of English cultivated rhubarbs compares favorably with that of the Asiatic drug, and that the ordinary cultivated *R. officinale* is superior to the highly cultivated variety. The total production of English rhubarb is estimated at 12,000 pounds annually, of which from 3,000 to 4,000 pounds are exported.

In a second paper the author communicates the details and results of analyses of five samples of rhubarb, four of them as above, the fifth being an authentic specimen of Russian rhubarb from the Materia Medica Museum, Owen's College. For comparison with the above it may be stated that the Russian rhubarb yielded: Cathartic acid, 3.2; chrysophan and tannin, 11.0; resinous substances, 5.2; mucilage, 5.5%. Yearbook of Phar., 1884, 435–443.

Rhubarb—Chrysophan and other Constituents.—According to Kubli, chrysophanic acid does not normally occur in rhubarb, but is produced when the root is digested in water through the breaking up of the glucocide *chrysophan*, probably under the action of a ferment. This ferment Mr. Kubli supposes to be soluble in water, but insoluble in alcohol, on which account an alcoholic extract of the root can be evaporated without the formation of chrysophanic acid. On the other hand, it is to the presence of this ferment that he attributes the progressive deposition of chrysophanic acid from a rhubarb extract prepared with diluted alcohol. Phar. Jour. and Trans., June 27, 1885, 1067; Phar. Zeit. f. Russl., xxiv., 193.

PHYTOLACCACEÆ.

Phytolacca Decandra—Analysis of the Fresh Root.—Mr. Edmond Preston, Jr., has subjected the fresh root to proximate analysis, and has determined—besides the constituents determined by previous experiments—i. e. starch, tannin, gum, sugar, resin, fixed oil, and lignin—the presence of a *volatile acid*, characteristic of phytolacca root, and also an alkaloid, for which he proposes the name of *Phytolaccine*. A strong decoction of the root was precipitated with solution of subacetate of lead, filtered, and the lead precipitated from the filtrate by a current of hydrosulphuric acid gas; again filtered, and a portion evaporated to a small bulk. This was divided into four parts, and tested for alkaloids with phosphomolybdic acid, tannin, iodohydrargyrate of potassium and auric chloride; each gave a precipitate indicating the presence of an alkaloid, to separate which the following method was used:

The filtrate from the lead precipitate was carefully concentrated and mixed with an equal volume of saturated alum solution. The mixture was heated, ammonia added in slight excess, the whole evaporated on a water-bath, and the residue powdered and extracted with alcohol. On evaporating the alcoholic liquid a yellowish mass of small crystals was obtained. This was redissolved in alcohol, the solution passed through animal charcoal and carefully evaporated, when small, nearly white crystals were left. These were quite soluble in alcohol, moderately so in water and nearly insoluble in ether and chloroform. They were entirely dissipated when heated upon platinum foil, and in aqueous solution gave precipitates with the four alkaloidal reagents before mentioned. With strong nitric, sulphuric or hydrochloric acids the crystals simply dissolved, giving no characteristic color test.

The alcoholic solution of the crystals, neutralized with diluted hydrochloric acid, on concentration yielded nearly colorless acicular crystals, which were moderately soluble in alcohol, quite soluble in water, and possessed a strong acrid taste. These the author believes to be the hydrochlorate of the new alkaloid.

In respect to the phytolacca plant, the author notes that while observing it at night in the fall, the leaves presented a phosphorescent appearance in the dark. This phenomenon is mentioned in Gmelin's Chemistry (Vol. I., 188), but appears to have escaped the attention of the authors of the Dispensatories, in which it is not mentioned.

The author found the fresh root to lose, on drying, 80.729% of its weight, and the air-dry root of commerce 29.046%. The root yields 8.4% ash, principally composed of potassium salts.—Amer. Jour. Phar., Nov. 1884, 567–570.

AMARANTHACEÆ.

Telanthera polygonoides, Moq.—*Uses in the South.*—Dr. E. W. Lane reports this plant to Dr. H. H. Rusby under the name of "Piss-a-bed." It is used as a diuretic and anti-spasmodic, and in cases of strangury.—Amer. Jour. Phar., Feb. 1885, 91.

PLANTAGINACEÆ.

Bartung—Botanical Source.—Bartung is a seed in great repute in Persia for dysentery. A sample of the seed received by Colonel Beddome,

F. L. S., from Persia, was sowed at Kew, and, according to W. T. T. Dyer, turned out to be

Plantago Major.—Dr. Forbes Watson, in his "Index to Native and Scientific Names," gives the following identifications of *bartung* with various species of *Plantago*, viz: *Pl. lanceolata*, Lin. (Irvine), *Pl. major*, Lin. (Honigberger), and *Pl. Psyllium*, Lin. (Birdwood).—Phar. Jour. and Trans., Aug. 9, 1884, p. 101.

Under the name of semences de psyllium (herbe aux puces) the French Codex recognizes the seeds of *Pl. Psyllium*, Lin., and (?) of *Pl. arenaria*, Waldstein and Kitaibel. The seeds of the latter are somewhat smaller and darker colored than those of the preceding species. The larger and lighter colored seeds of *Pl. Cynops*, Lin., are said to be likewise used as psyllium seed or fleaseed. The mucilage obtained from these seeds is stated to be used in Southern Europe in the finishing processes of muslin. —Amer. Jour. Phar., Feb. 1885, 107.

PLUMBAGINACEÆ.

Baycuru Root—Proximate Examination.—Mr. Frederick A. Dalpe has subjected this root—believed by Mr. E. M. Holmes to be that of *Statice Brasiliensis*—to proximate examination, with the following results:

1. Moisture	8.5 per cent.
2. Ash	9.66 per cent. sulphates, chlorides and phosphates of sodium, potassium, magnesium and calcium.
3. Benzol extract	.388 per cent. resin, wax and coloring matter.
4. Alcoholic extract	16.4 per cent. alkaloid, tannin (12.15 per cent.), resin (1.66 per cent.)
5. Aqueous extracts	Infusion 8.66 per cent. gum. Decoction 9.39 per cent. glucose, gum.
6. Volatile principle	Volatile oil (trace).

The benzol, alcoholic and aqueous extracts were obtained by treating the same portion of root with the respective solvents successively and in the order named, drying the residue each time before treating it with the next solvent. The portions so obtained were then examined with the results above indicated.—Amer. Jour. Phar., July 1884, 361–365.

OROBANCHACEÆ.

Crescentia Cujete, L—*Analysis of the Fruit.*—Mr. Gustav Peckolt has subjected the fruits of this South American plant to proximate analysis. The shell of the fruit amounts to 22.91%. 1,000 grams of the pulp yielded 292.792 grams of juice.

In 1,000 grams of the pulp the author found:

Soft resin (yellow)	7.750 gm.
Acid resin (brown)	9.625 "
Coloring matter (black blue)	4.516 "
Bitter extractive	1.260 "

Aromatic extractive	5.000 gm.
Tannic acid	3.264 "
Vegetable acid	18.264 "
Crescentinic acid (crystallized)	1.201 "
Tartaric and malic acids	5.050 "
Albumen, dextrin, pectous bodies, salts, etc.	6.857 "
Water	920.000 "
Cellulose	17.403 "

The fresh pulp yielded 0.5% of ash; the dry pulp 6.25%. The new acid—*Crescentinic acid* was obtained in form of four-sided prisms. It is colorless and odorless and has a sour taste; sparingly soluble in cold water, readily in hot water and in alcohol; insoluble in ether, chloroform and petroleum ether. With carbonates of the alkalies it forms soluble salts, which may be purified from their alcoholic solutions; with caustic potassa a brownish color is produced. The solution of the acid is precipitated by copper and lead salts; ferric chloride produces no reaction in the cold, but when heated a brown precipitate results. The *Blue Coloring Matter* appears to be a substance similar to indigo.

This fruit is used extensively by the Indians of tropical South America. The dried shells are used, according to size, as bowls, drinking goblets, plates, dippers, etc., and, when polished and painted, form various ornamental articles. The pulp is valued medicinally, being used as a laxative. The author has prepared an alcoholic extract, which is obtained from the fresh pulp to the amount of 7%, and found this to be effective as a gentle laxative in doses of 0.1 gram, whilst 0.5 gram produced a decidedly drastic effect without, however, causing pain or other inconvenience. The pulp, boiled with water until a black pasty mass is produced, is used in the form of a plaster against erysipelas.—Phar. Rundschau, Aug. 1884, 166–168.

SCROPHULARIACEÆ.

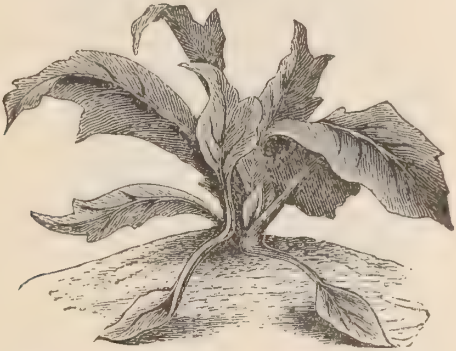
Franciscea uniflora—Constituents.—Mr. Lenardson has subjected this drug, which consists of pieces of the stem and root of *Franciscea uniflora*, and which is brought into commerce under the name of

Manaca, or *vegetable mercury*, to proximate examination. The two most important constituents appear to be an alkaloidal body, which the author has named *manacine*, and a fluorescent substance. Manacine has a composition represented by the formula $C_{15}H_{23}N_4O_5$. It is described as a light yellow dry hygroscopic powder, having a faint bitter taste, and only weak basic properties. Though it dialyzes readily it has not yet been obtained in the crystalline form. It is freely soluble in water, and in ethylic and methylic alcohol, but insoluble in amylic alcohol, ether, chloroform, and benzin. The solutions are very unstable, that in hydrochloric acid being most permanent. Both the alkaloid and the fluorescent body were found in the wood as well as in the bark.—Phar. Jour. and Trans., Aug. 2, 1884, 82.

SOLANACEÆ.

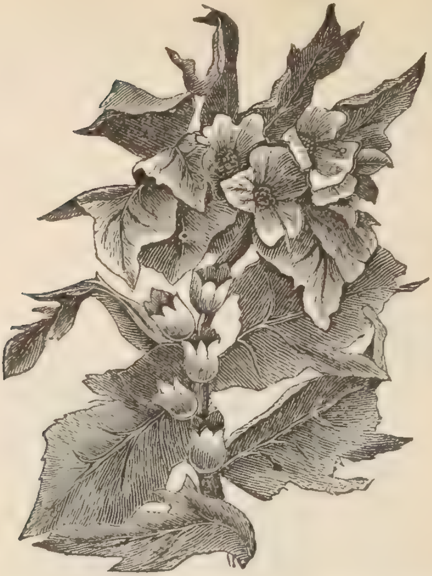
Hyoscyamus Leaves—Distinction of the Annual and Biennial Varieties. —Mr. William Gilmour, in view of the conflicting opinions as to whether hyoscyamus is an annual or biennial plant, has communicated a paper in which he illustrates and describes: (1) the biennial plant, first year's growth; (2) the biennial plant, second year; (3) the annual plant proper. The author also indicates the best means of preventing and detecting adulterations of the officinal leaves. Fig. 32 shows the biennial henbane in its first year's growth. It will be noticed that it has no aërial stem, the leaves being all stalked and proceeding from the stem underground. This plant continues to put forth fresh leaves, to replace those cut in the earlier part of the season, until well on in autumn, when the first touch of frost causes them to wither away. The root survives the winter, and in the succeeding spring develops a tuft of small leaves, from the centre of which a stem soon appears, bearing leaves, which embrace the stem, and which, therefore, are not stalked. Fig. 33 will sufficiently show this without further explanation. Fig. 34 shows the annual plant, which develops its stems and flowers in one year and then dies. When growing, no one could possibly mistake the one variety for the other. The stem (as well as the leaves and flowers,) of the annual is smaller and less branching, while the leaves are also less downy, less sinuated, less clammy, and possessing less of the peculiar narcotic odor characteristic of the henbane plant. When in the dried state, most of these characteristics disappear, if not entirely, at least to such an extent as to make recognition between the varieties difficult, if not impossible, particularly in the broken state in which they are generally sold. It is true the odor might still indicate to a certain extent a genuine from a spurious sample, while any one who has bruised the two varieties in a mortar would not fail to notice the irritating effects produced on the throat and nostrils from the downy dust of the biennial plant.

FIG. 32.



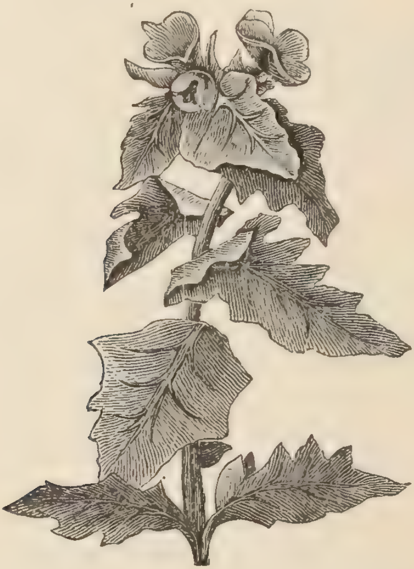
Biennial Henbane, First Year's Growth.

FIG. 33.



Spray of Biennial Henbane, second year's growth, height 3 to 4 feet.

FIG. 34.

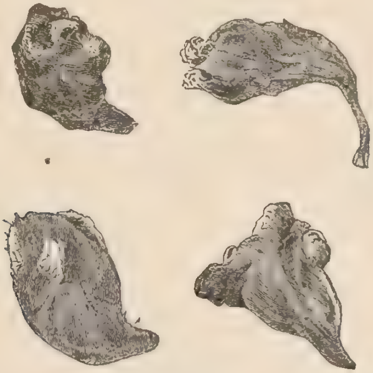


Annual Henbane, height 12 to 18 inches.

It must be admitted, however, that these are by no means infallible indications of a genuine sample, especially if we keep in mind that the rankness of the odor of the biennial henbane differs at various stages of its development, and, further, that a very small percentage indeed of the genuine in presence of the spurious would entirely vitiate any conclusions arrived at from such a very crude test. In circumstances such as these it is important to know that there is one test, simple but thorough, whereby the presence of even a very minute quantity of the annual plant can be detected among the biennial. It is a peculiarity of the annual variety that, while the deep purple venation of the corolla, so beautifully displayed in the biennial, is sometimes present, it is much more frequently entirely absent, the petals being altogether of a pure sulphur or primrose yellow. This never happens in the case of the biennial, the blossom being almost permeated with very deep purple veins. Mr. Usher, of Banbury, to whom the author is indebted for photographs of the plants, informs him that while probably 10 per cent. of the annual variety may have the purple venation less deep and less elaborately intersected compared with the other variety, at least 90 per cent. will have the pure yellow blossom. On the other hand, he has not once met with this pure yellow blossom in the biennial variety in all his long experience. Here, then, we have a test, simple but thorough, for detecting any substitution, namely, the occurrence of yellow blossom devoid of purple venation in any suspected sample. The presence of even one pure yellow petal is sufficient to indicate adulteration with the annual plant.

The author protests against the practice which has prevailed of recent years of presenting the henbane leaves in a chopped or semi-pulverized condition, no other circumstances so much favoring adulteration with inferior qualities. The substitution which more frequently prevails, and which, owing to the broken or bruised state of the henbane as generally presented to the pharmacist, is very difficult of detection, is that of less valuable varieties of henbane for the more valuable officinal variety. Pharmacists, however, have this matter very much in their own hands.

FIG. 35.



Dried flowering tops of Biennial Henbane with leaves.

Were they in every case to refuse the chopped-up or broken samples, and insist upon being supplied with the flowering tops of the biennial plant alone, that is to say, the cluster detached from the stem where all the finest young leaves converge round the blossom, substitution would be practically rendered impossible. The author has attempted to figure (Fig. 35) the appearance of several of these clusters in the dried state, but it is difficult to do more than give a sketch of their general contour. It will be noticed that, while each cluster may exhibit a different outline, they all present one characteristic which it is impossible to mistake. Each cluster detached from the parent stem is complete in itself, and each has the beautiful purple venated petals peeping out here and there from between the mass of young leaves, showing the true origin of the plant. Amer. Drug., Aug. 1884, 142–143, from Chem. and Drug.

Belladonna—Alkaloidal Value of the Cultivated and the Wild Plant.—In a previous report (see Proceedings 1882, 400), Mr. A. W. Gerrard had shown that the wild belladonna contained more alkaloid than the cultivated, and that the alkaloid was generally more abundant in the leaves than in the root. In a second report (see Proceedings 1883, 113) it was pointed out that belladonna attains its highest state of development, as regards alkaloid, at the period of flowering. In the present report, which is final, the author has repeated a number of the previous experiments, with a view to confirmation, and has likewise submitted the second, third and fourth year's growth of belladonna to analysis, the object being to ascertain if any notable difference would be found in the alkaloidal yield of the plant at these various ages. The results of these latter investigations are given, as follows:

PERCENTAGES OF ALKALOID FROM WILD BELLADONNA.

Age of Plant.	Yield from Root.	Yield from Leaf.
2 years.	.260 per cent.	.431 per cent.
3 years.	.381 per cent.	.407 per cent.
4 years.	.410 per cent.	.510 per cent.

PERCENTAGES OF ALKALOID FROM CULTIVATED BELLADONNA.

Age of Plant.	Yield from Root.	Yield from Leaf.
2 years.	.207 per cent.	.320 per cent.
3 years.	.370 per cent.	.457 per cent.
4 years.	.313 per cent.	.491 per cent.

The results throughout are confirmatory of previous results, and, with a single exception, the leaves yielded more alkaloid than the roots. The author's method of analysis was found very satisfactory, and is believed to give accurate results. It consists in making an alcoholic extract of the fine powder dried at 100°–105° F., distilling the extract in water, and treating the solution with ammonia and ether. The ethereal solution being evaporated, the residue is taken up by acetic acid, the solution again treated with ammonia and extracted by ether, which leaves the alkaloid, on evaporation, in a pure condition. The amount of alkaloid was then found volumetrically by means of a dilute sulphuric acid, 100 cc. of which exactly neutralizes 1 gram of atropine. The author's conclusions from his experiments are as follows:

1. Wild-grown belladonna contains a larger quantity of alkaloid than the cultivated kind, but the difference is not so great as to make any material difference which variety is used in making pharmaceutical preparations; nevertheless, for uniformity's sake the cultivated only should be used, the wild being retained for making atropine.

2. The leaves, without exception, have been found to yield the highest percentage of alkaloid; following these the root, fruit, and stem is the order of sequence. From this observation it would seem that preparations of the leaf should supersede those of the root, but when we consider the great strength of the liniment of belladonna, the only official preparation made from the root, its comparative cleanliness and the general satisfaction it gives the medical profession, there is no good reason to advocate a change. The expediency of introducing an alcoholic extract of the leaves into the B.P. will be generally acknowledged, for such an extract is occasionally required in most dispensing establishments, for making belladonna suppositories, and it certainly would supersede with advantage, in belladonna plaster, the extract made by the sadly unskilful process now official.

3. It was shown in a previous communication that the first year's growth of belladonna is a small plant, unworthy of collection, containing but little alkaloid; from the second to the fourth year the quantity is fairly uniform. At these ages then, and at the period of flowering, is the best time for collecting the plants.

4. From an examination of the roots collected in spring, summer, and autumn, it was found that they contained about the same amount of alkaloid, so that the process of leafing and flowering does not exhaust the roots of alkaloid, but the experiment shows there is a simultaneous development of root and leaf; therefore the roots may be gathered at the same time as the leaves.—Yearbook of Phar., 1884, 447–451.

Referring to their process for extracting the alkaloids of belladonna root (see Proceedings 1884, 134), Messrs. William R. Dunstan and Francis Ransom observe that they have since met with some difficulties in carrying out the process with belladonna leaves. Many of them have since been overcome and they hope soon to prepare a simple method for the estimation of atropine and hyoscyamine in the leaves.—Ibid., 451.

Belladonna and Hyoscyamus—Cultivation.—Mr. T. J. Hasselby describes his experience in the cultivation of belladonna and hyoscyamus in a small way. The paper will be found particularly interesting to those who may have opportunity to experiment in a similar direction.—Ibid., 452–453.

Japanese Belladonna Root—Active Constituent.—Prof. Eykman confirms the statement of Dr. Langgard that the root of

Scopolia Japonica contains a powerful mydriatic alkaloid. He proposes the name of *scopoleine* for the new alkaloid, which appears to belong to the tropeine group, but its exact relation is not yet defined. The author also obtained a recent body, which is non-nitrogenous, and to the presence of which the fluorescence obtained by other chemists in extractions of the root appear to be due. This body the author has named *scopoletin.* It forms colorless needles and prismatic crystals, is soluble in hot alcohol and boiling water, less soluble in cold water. The aqueous solution has an acid reaction, and all its solutions show a strong blue fluorescence.

In a subsequent paper Prof. Eykman states that scopoletin is the decomposition product of a glucoside, for which he proposes the name of *scopolin.* It forms white acicular crystals, which are slightly soluble in water, but readily in hot water, alcohol, ether, and chloroform. When boiled with dilute acids it undergoes decomposition, which is represented by the equation—$C_{34}H_{30}O_{15}+2H_2O=2C_6H_{12}O_6+C_{12}H_{10}O_5$. The new glucoside has a narcotic action, but does not dilate the pupil of the eye.—Phar. Jour. and Trans., Aug. 1884, 81; from Nieuw Tijdschr. Phar., 1885, 154 and 177.

Scopolia luridus, Dunal.—Medicinal Value.—Dr. E. J. Waring draws attention to this plant, a native of Nepaul and the Himalayas, as being equal in its mydriatic properties, if not superior, to belladonna. The leaves are of a pale green color, and emit a tobacco-like odor. A tincture prepared from them of the strength of one ounce to eight ounces of alcohol, is said to have produced extreme dilation of the iris in different patients, in two instances to such an extent as to cause blindness, which only disappeared when the medicine was discontinued.—Phar. Jour. and Trans., June 27, 1885, 1066; Brit Med. Jour., June 6, 1885, 1145.

Mandragora Officinalis—Isolation of Alkaloidal Principle.—Although authors agree in attributing to this plant narcotic, stupefying and mydriatic properties, there is some difference of opinion as to the intensity, some looking upon the plant as more poisonous than belladonna, and others as less. As one step towards clearing up the doubt, Mr. Crouzel has isolated the alkaloid which has generally been supposed to be identical with atropine. Having made a tincture of the root, he added lime water, filtered and treated the clear liquor with an equal volume of ether. Upon evaporation the ether yielded crystals of a substance presenting all the characters of an alkaloid, and having a bitter and nauseous taste. This body he proposes to call

Mandragorine.—It forms a crystalline sulphate, and a solution of the salt was found to dilate strongly the pupil of the eye of a rabbit.—Phar. Jour. and Trans. June 27, 1885, 1067; L'Union Phar., June 1885, 264.

VERBENACEÆ.

Verbena Hastata—Medicinal Use, etc.—Alexander A. Weber has found the blue vervain to be an excellent sudorific. The root, leaves and flowers are used, but the root, which has a bitter, astringent and nauseous taste, is the most active. The *fluid extract* is a convenient preparation and is made with diluted alcohol in the usual manner; the dose of it is one-half to one fluidrachm.—Amer. Jour. Phar., Dec. 1884, 616.

LABIATÆ.

Collinsonia Canadensis, L.—*Proximate Examination of the Rhizome and Leaves.*—Mr. Charles Napier Lochman has subjected the rhizome and leaves of this plant to proximate examination. The rhizome is from one to one and a half inches in thickness, four to eight inches long, irregularly branched, the upper surface marked with cup-shaped scars left by the stems of former years; on the lower surface it is covered with long, thin, brown rootlets; it has a thin, brown bark, and a very hard white wood, more or less mottled with brown. The leaves are thin, smooth, light green above (somewhat darker in the dried state), whitish underneath, ovate, coarsely serrate, abrupt, or somewhat heart-shaped at the base, taper-pointed; the under surface dotted with small, depressed glands containing volatile oil. Sixteen pounds of the fresh leaves yielded on distillation about one drachm of a very light yellow volatile oil, having a pleasant lemon-like odor. They contain, besides waxy matter, a caoutchouc-like substance, chlorophyll and tannin, but not a trace of alkaloid. The rhizome was shown to contain resin, wax, tannin, mucilage and starch. The volatile oil of the leaves is nearly all dissipated on drying, at least after several months.—Amer. Jour. Phar., May 1885, 228–231.

Leonotis Leonurus—Medicinal Value.—This plant, which is used medicinally at the Cape of Good Hope, forms the subject of a colored illustration in the "Garden" (April 1885, 368). Its handsome orange-yellow whorls of labiate flowers make it a favorite garden ornament in warm countries. In Constantinople, it shares in common with *L. intermedia* the name of "minaret flower," but at the Cape it is known as the "wild dagga." The plant appears to possess purgative properties, and is used in the form of decoction as an emmenagogue, and also in chronic skin diseases. By the Hottentots it is smoked like tobacco.—Phar. Jour. and Trans, May 2, 1885, 890.

CONVOLVULACEÆ.

Ipomœa Sinuata, Ortega—*Use of the Leaves.*—Mr. E. Ferguson, while on a visit to Colombo, had his attention drawn to this plant, the leaves of which give out, when rubbed between the fingers, a decided bitter-almond odor. The plant is interesting from the fact that the liqueur, known as "noyau," was originally prepared from the leaves. The plant in fact is known in the West Indies under the name of "noyau plant." The author gives some further interesting information in reference to this plant as well as to noyau, which see in Phar. Jour. and Trans., Aug. 23, 1884, 147.

Ipomœa Pandurata—Characters, etc.—This plant is stated to be a hardy perennial, having some medicinal value, with large white flowers, having a purple eye, and produced on one to five-flowered peduncles. The leaves are usually heart-shaped, but sometimes fiddle-shaped. It contains a purgative resin to the extent of 1.5 per cent. The plant is illustrated by a woodcut in the "Garden," April 25, 1885, 368, Phar. Jour. and Trans., May 2, 1885, 891.

POLEMONIACEÆ.

Phlox Carolina—Proximate Examination.—Mr. Wm. C. Boynton found that the root of this plant contained 9.5 per cent. of moisture and yielded with diluted alcohol 17.57 per cent. of extract. The ash is stated to have amounted to 18.8 per cent.; a quantitative determination of its constituents was not made.—Amer. Jour. Phar., Nov. 1884, 570.

LOGANIACEÆ.

Spigelia—Proximate Examination.—William C. Boynton, on examining true pinkroot, obtained the following results. Moisture 8.621, benzol extract (resin, wax and fat) .518, alcohol extract (resin, tannin, extractive) 7.418, and water extract (gum, tannin, extractive) 11.008 per cent.; with diluted alcohol 18.64 per cent. of extract were obtained; the ash amounted to 20.5 per cent.—Amer. Jour. Phar., Nov. 1884, 570.

Strychnos Nux Vomica Indigenous to Ceylon—Examination of Pulp and Seeds.—Messrs. Wyndham Dunstan and F. W. Short have previously described (see Proceedings, 1883, 122), the results of a chemical and botanical examination of the seeds of *Strychnos Nux Vomica*, which came into England under the name of "Bombay," "Cochin," and "Madras." They have now been enabled, through the courtesy of Dr. Ondaatje, of Ceylon, to similarly examine nux vomica from Southern Ceylon, where the plant is very abundant. The paper is illustrated by cuts from drawings made by Dr. Ondaatje, representing the fruit, a branch with leaves, a branch with fruit, and the seeds. The botanical character of these parts coincides in general with the description of other authorities. The seeds and pulp were subjected to chemical examination. As in their previous research, the alkaloidal content of the seeds was found to be in direct proportion to their size, and inversely as their number in the fruit.

The seeds of *S. nux vomica* indigenous to Ceylon, are especially noteworthy for their extremely high alkaloidal contents, every specimen containing much more alkaloid than the authors found in the richest specimen of nux vomica seed previously examined (3.90%). The authors have furthermore demonstrated the poisonous nature of the pulp, which is usually spoken of as having no toxic action. Analysis of the dried pulp showed that 100 parts contain:

Water	22.0
Strychnine	1.4
Brucine	1.0
Loganin (see Proceedings 1884, 327)	5.0
Ash (K_2CO_3, Na_2CO_3, $CaCO_3$, Li_2CO_3, etc.)	5.0
Fixed oil, mucilage, gum, etc.	65.6

The seeds from fruits of four typical sizes were subjected to examination, with the results shown in the following table:

Size of Fruit	Weight of Fruit	Diameter of Fruit	Number of Seeds in each Fruit	Weight of Seeds	Diameter	Thickness	Circumference
No. 1.	About 140 gms.	52 m. m.	2–9, usually 4.	Large seeds . . . . 2–2.5 gms. Small seeds . . . . 1–1.5 gms.	13–25 m. m., average 22.	3–5 m. m., average 4½.	40–75 m. m., average 66.
No. 2.	About 78 gms.	35 m. m.	2–3–4, usually 2.		15–24 m. m., average 22.	3–5½ m. m., average 4–4½.	45–72 m. m., average 66.
No. 3.	About 12 gms.	29.5 m. m.	1, rarely 2.		15–23 m. m., average 21.	3–5½ m. m., average 4½.	45–70 m. m., average 63.
No. 4.	About 4 gms.	25 m. m.	Usually 1 good or 2 abortive.		8–22 m. m., average 17–20.	2–5 m. m., average 4.	24–67 m. m., average 58.

Size of Fruit . . .	Nature of Edge . . .	Texture	Form	Interior	Percentage of Strychnine	Percentage of Brucine.	Percentage of Total Alkaloid . . . .
No. 1.	Nearly all rounded.	Silky.	Mostly circular, flat and concavo-convex.	Cotyledons 5-veined, albumen slightly resinous.	1.52	2.95	4.47
No. 2.	Rounded, with few acute.	Silky.	Circular, mostly concavo-convex, some flat.	do.	1.78	3.16	4.94
No. 3.	Rounded, with very few acute.	Silky.	Circular, concavo-convex, with some flat.	do.	1.71	3.63	5.34
No. 4.	Nearly all rounded.	Rather silky.	Mostly circular, irregular.	do.	1.68	2.86	4.54

An analysis of large and small seeds from the same fruit showed the large seeds to contain 1.8 strychnine, 3.5 brucine, whilst the small seeds contained 1.8 strychnine, but only 2.61 per cent. brucine.—Phar. Jour. and Trans., July 5, 1884, 1–6.

Strychnos Nux Vomica and S. Ignatia.—Microscopic determination of *Brucine* and *Strychnine*, which see under "Organic Chemistry."

Strychnos Toxifera—Toxic Constituents.—The root bark of a species of *Strychnos*, identified by Prof. Planchon as *S. toxifera*, used by the Piaoras Indians in the preparation of *strong curare*, has been submitted to a chemical examination by Villiers. By exhausting the powdered bark, previously treated with ether to remove fat, with alcohol, distilling off the alcohol and exhausting the residual extract with water, he obtained a substance corresponding in solubility and chemical reactions, as well as physiological action, to ordinary *curarine*. All his efforts, however, to isolate an alkaloid in a pure state were fruitless, the result pointing to the probability that the product was not a definite body, and that the alkaloidal portion was always accompanied by extractive matters which were precipitated at the same time by the same reagents. All the precipitates were amorphous, and no crystalline salts could be obtained.—Phar. Jour. and Trans., June 27, 1885, 1067; Jour. de Phar. et de Chim., (5) xi., 653.

Gelsemium Sempervirens, Ait.—*Medicinal Value.*—Dr. E. W. Lane, reporting to Dr. H. H. Rusby, speaks very highly of the value of the yellow jessamine, and of its uses in the South. In his hands, and in the hands of his acquaintances, it has sustained the reputation it has generally gained. An interesting fact is that a majority of the country practitioners in that section prepare their own extracts, using eight ounces of the bark of the green root to the pint of dilute alcohol. If this practice is general throughout the South, it would materially affect the estimate of the consumption of this drug.—Amer. Jour. Phar., Feb. 1885, 91.

ASCLEPIADACEÆ.

Asclepias Incarnata—Medicinal Uses.—Dr. J. Hosack Frazer recommends *Asclepias incarnata* as a speedy, potent and reliable diuretic, possessing the advantage of frequently acting as a stomachic, and of not causing any gastro-intestinal disturbances. The dose is ½ to 1 drachm of the fluid extract every three hours. He has found it effective with cases in which other well-known diuretics had failed.—Practitioner, Aug. 1884, 141; Pharm. Jour. and Trans., Aug. 30, 1884, 161.

Vincetoxicum Officinale.—Characters, etc., of the glucoside "*Vincetoxin,*" which see under "Organic Chemistry."

Gonolobus Condurango—Constituents.—It having been observed that the aqueous extract of condurango bark prepared without heat becomes strongly turbid when warmed, resembling in this respect one prepared from the root of the nearly allied *Asclepias Vincetoxicum*, from which Mr. Tanret recently separated the curious principle which he has named vincetoxin (which see under "Glucosides,") Dr. Vulpius was induced to subject some condurango bark to the same treatment as that followed by Mr. Tanret. He obtained products soluble and insoluble in water, corresponding in their behavior in every respect with what Mr. Tanret considers to be a soluble and an insoluble modification of vincetoxin. An aqueous solution of the soluble form became turbid upon being heated, and a two per cent. solution formed a tolerably stiff jelly whilst still far below the boiling point. Whether these products are also identical in composition with vincetoxin, or whether they will have to be added to the new group under the name of "*condurangin,*" has yet to be determined by analysis. The body appears to be a glucoside. Dr. Vulpius also observed slight traces of a basic substance, and of a compound of an acid character, insoluble in water.—Phar. Jour. and Trans., June 27, 1885, 1067; Arch. d, Phar., xxiii., 299.

SAPOTACEÆ.

Bassia Longifolia—Proximate Analysis of the Seeds.—E. Valenta ascertained the seeds to contain fat 51.14, alcohol extract 7.83, tannin 2.12, bitter principle, soluble in water 0.60, starch 0.07, mucilage 1.65, soluble albumin 3.60, extractive 15.59, insoluble proteids 4.40, total ash 2.71 (in the soluble portion 0.95), fibre (and loss) 10.29 per cent. The fat is yellow, is bleached on exposure, and soon becomes rancid. It has the specific gravity 0.9175 at 15° C., melts at 25.3°, solidifies at 17.5 to 18.5, and contains considerable quantities of free fatty acids, but only a small amount of glycerol. It is partly soluble in alcohol, entirely soluble in ether, carbon bisulphide, benzene, etc., and contains palmitin and olein. The mixed fat acids obtained from the soap melt at 39.5° and solidify at 38° C.—Amer. Jour. Phar., Feb. 1885, 108, from Dingl. Polyt. Jour., vol. 251, page 461.

Butyrospermum Parkii—A Probable Source for Gutta-Percha.—Mr. Heckel has drawn the attention of the Academy of Sciences (Paris) to the importance of the *Shea butter tree* as a source of gutta-percha. The milky juice of the trunk when solidified has, he states, all the appearance and properties of gutta-percha. A further communication is promised, giving the physical properties and chemical composition of this gutta. Mr. Heckel states that the tree can be tapped when four years old, and that it grows readily in argillaceo-siliceous and ferruginous soils, and is found over a large extent of country. He also suggests that the *Bassia* trees of India should be examined with respect to the character of the milky juice they contain.—Compt. Rend., C. 1238; Phar. Jour. and Trans., May 30, 1885, 986.

Commenting on the above, the editor of "Phar. Jour. and Trans." observes, that if Mr. Heckel's statement is correct, the new substance must differ very considerably from the "gutta shea" separated by English chemists from Shea butter, this being friable and wanting in tenacity.—Ibid.

STYRACEÆ.

Siam Benzoin—New Constituent.—Mr. E. Hirschsohn makes an interesting preliminary communication on a newly-observed constituent of Siam benzoin. Upon shaking the finely powdered resin with about ten times its weight of bisulphide of carbon, and allowing the mixture to stand, it separated in twenty-four hours into two layers, the upper one thick and containing insoluble resin, the lower one a clear yellow solution. This solution was filtered, concentrated to one-fourth, and set in a cool place, when, after a few days, colorless, warty crystals separated. These had a vanilla odor, and formed neutral solutions with bisulphide of carbon, ether, benzol, chloroform and 95 per cent. alcohol. The alcoholic solution, upon being boiled, assumed a yellowish-green color, and then showed an acid reaction. The crystals were insoluble in water, but upon boiling them in water they melted to an oily mass, the liquid then having an acid reaction, which gradually became more intense, and eventually yielding fresh crystals, that may have consisted of benzoic acid. Concentrated sulphuric acid dissolves the original crystals with a beautiful red color, and by shaking the acid solution with ether, and evaporating, a crystalline body was obtained, showing all the characters of benzoic acid.—Phar. Jour. and Trans., Nov. 1, 1884, 343; Phar. Zeitschr. f. Russl., xxiii, 601.

Rasamalas—A Peculiar Storax.—Mr. E. M. Holmes states that the information obtained from Mr. Jamie seems to confirm Hanbury's statement that this liquid storax is not obtained from the rasamala tree, Liquidambar Altingiana, *De Candolle.* It is imported from Arabia and Persia, and is valued at $30 per picul (133⅓ pounds). It is used for scenting clothes and rampah-rampah (spiceries), and for rubbing over the body, also for swollen testicles. It is mostly sent from Bombay to Java. The black and white rasamalas seem to be identical, the latter being probably colored for the market.—Amer. Jour. Pharm., May, 1885, 247, Phar. Jour. and Trans., Dec. 20, 1884, 482.

Ericaceæ.

Arctostaphylos Uva-Ursi.--Isolation of "*Arbutin* and *Arbutose*," which see under "Glucosides."

Vaccinium Arctostaphylos, Lin. (Trebizond tea.) *Characters, etc.*—From communications by E. M. Holmes and W. J. T. Dyer to "Phar. Jour. and Trans.," January 17 and March 27, 1885, it appears that this tea was first prepared about the year 1877, and became a commercial article in 1880. About 5,000 ocques (the ocque=2¾ lbs.) are manufactured annually, the cost on the spot being about 5 piastres per ocque. The plant grows in Trebizond, Kroum and other parts of Asiatic Turkey, on mountains not below an altitude of 5,000 feet, and is not found beyond the mountains of Gummohame. The tea is manufactured by Circassian planters in the province of Roum, and has the appearance and aroma of coarse black tea, but has a sweet and somewhat less astringent taste. The best quality is yielded in May, several gatherings being made during the year. The leaf is much thinner than the true tea leaf, and could, Mr. Holmes thinks, be easily distinguished by a botanist from the true tea leaf when soaked in water, should the tea even come into use as an adulterant of cheap teas.—Amer. Jour. Phar., June, 1885, 308.

Andromeda Leschenaultii—Occurrence in the Nilgiris.—Dr. Waring draws attention to the fact that this plant, which Broughton has shown to contain an oil resembling oil of wintergreen, grows in great abundance in the upper ranges of the Nilgiris. He thinks that the oil could be obtained from this source in great abundance, and cheaply, and that apart from its possible utility as a source of natural salicylic acid, the oil is worthy of trial as a stimulant, carminative and antiseptic.—Phar. Jour. and Trans., June 27, 1885, 1066; Brit. Med. Jour., June 6, 1885, 1145.

Rhododendron Maximum, L.—*Proximate Analysis of the Leaves.*—Mr. Gustav Frank Kuehnel has subjected a quantity of the leaves of the "great laurel," collected by Mr. H. C. C. Maisch in the neighborhood of Cresson Springs, Pa., to proximate analysis, and found them to contain, besides tannin, gallic acid, resin, wax, albumen, coloring matter, and traces of volatile oil, the principles that appear to be characteristic for the coriaceous leaves of ericaceous plants, viz.: *arbutin*, *ericolin*, and *ursone*.—Amer. Jour. Phar., April 1885, 164–165.

COMPOSITÆ.

Composite Plants Used as Remedies in the South.—Dr. H. H. Rusly draws attention to a number of native Southern remedies, which are reported to him with specimens of the plants by Dr. E. W. Lane, of Scarboro, Ga. Among the plants so reported are the following:

Eupatorium fœniculaceum, Willd., the Fennel-like Boneset. Reported as the "White-flowered Dog-fennel" (but the true Dog-fennel is *Anthemis Cotula*, L.). Dr. Lane testifies to it as a strong diuretic and one used with success for both man and beast. One pint of the strong decoction is an effectual drench for horses afflicted with "what is commonly called gravel."

Eupatorium perfoliatum, L. Boneset or Thorough-wort.

Eupatorium rotundifolium, L. Reported under the name of "Wild Horehound."

Eupatorium aromaticum, L. Reported as "Upland Wild Horehound." The report on the three last confirms the well-known properties of these plants. It is a noteworthy fact that *E. fœniculaceum* should possess such marked diuretic power, while its congeners are nearly or quite deficient in that respect.

Sericocarpus tortifolius, Nees. One of the White-topped Asters. Reported as "Edgeweed," and said to be useful for colic in horses.

Solidago odora, Ait., the Odorous Golden-Rod. Used as a styptic; in the case of wounds, by applying the bruised plant; in the case of epistaxis, by snuffing up the powdered dried leaves. It may be noted here that attention has recently been called to the fact that in certain parts of the country an infusion of the leaves of this plant is very generally used as a beverage, as a substitute for tea, a regular trade in the article having sprung up in the shops.

Chrysopsis graminifolia, Nutt., the Grass-leaved Silver Aster. Reported as "Blue-grass" and "Fever-grass." Used as a poultice to sprains.

Helenium nudiflorum, Nutt., the Naked-flowered Sneeze-weed. Report refers to its well-known irritating properties when applied to the nostrils.

Gnaphalium purpureum, L., the Purple-flowered Everlasting. Reported as "Cough-weed," and as a remedy for coughs and colds.

Gnaphalium polycephalum, Mx., the Sweet-scented Life-everlasting. Reported as a diaphoretic and a poultice in tympanitis.

Pterocaulon pycnostachyum, Ell., the Indian Black-root. Said to possess tonic and emmenagogue and oxytocic properties. The latter is an interesting announcement as bearing on its well-known narcotic properties.—Amer. Jour. Phar., Feb. 1885, 90–91.

Artemisia gallica, Willd.—*Proximate Constituents.*—Messrs. Heckel and Schlagdenhauffen have examined *Artemisia gallica*, Willd., with the view of ascertaining whether it might not be available for the production of santonin. The authors believe it to be the famous Σαντόνιος, described by Dioscorides as a valuable vermifuge. They have found it to contain about 1 per cent. of essential oil, together with a crystalline compound (stearoptene?) which passes over in distillation. Submitted to the action of petroleum ether, the flower heads yield 3 per cent. of extract, which contains principally wax, a yellow coloring matter, and a little chlorophyll. Chloroform extracts from it a considerable amount of santonin, and a resinousmatter which seems to be an isomer of santonin. Alcohol removes from the whole plant glucose, tannin, coloring matter, and an alkaloid. The latter gives precipitates with alkaloidal precipitants, and will be the subject of further examination.—Phar. Jour. and Trans., Mar. 28, 1885, 791; Compt. Rend. C., 804.

Burdock Fruit—Proximate Analysis—Messrs. Henry Trimble and F. D. Macfarland have determined the following, which they believe to be the important constituents of the fruit of *Lappa officinalis*. The *moisture*, determined in the usual way, was found to be 7.30 per cent., and the *ash* 5.34 per cent. By extraction with petroleum spirit, a bland *light yellow oil*, amounting to 15.4 per cent. of the fruit, was obtained. The more important reactions of this oil are as follows: With fuming nitric acid a brown color and aromatic odor, but not becoming solid. With strong sulphuric acid a brown color, becoming thick and syrupy. Exposed to the air in thin layers, the oil solidifies. Alcohol and absolute alcohol do not dissolve it, but hot absolute alcohol, ether, chloroform and benzol are good solvents. The specific gravity is .930, determined with a larger amount of the oil prepared from 75 grams of the drug. Ether extracted from the remaining portion, 1.15 per cent. *resin;* alcohol extracted from the portion exhausted with ether, 12.6 per cent., the greater portion of which—amounting to 8.3 per cent. of the drug—was insoluble in water, and appeared to be a resin. The portion of the alcoholic extract which dissolved in water yielded a small quantity of a bitter crystalline substance, evidently an alkaloid, which the authors propose to name *Lappine*. This, together with other undetermined constituents, will be further examined.—Amer. Jour. Phar., March 1885, 127–128.

Pellitory Root—Therapeutic Uses.—Knowing that this drug has been found useful in paralysis of the tongue and pharynx, Dr. Roth was led to try it in the treatment of globus hystericus, which he regards as due to paræsthesia of the sympathetic. In six cases in which he used it satisfactory results followed. He gave it in doses of ten to twenty drops (?).—Phar. Jour. and Trans., Mar. 1, 1884, 344; Practitioner, 1884, 286.

Parthenium Hysterophorus—Medicinal Uses of Alkaloidal Principle.—An alkaloid obtained from this plant, and named *parthenine*, has been experimented with as a remedy for facial neuralgia by Dr. José R. Torar. He states that dose of 0.1 gram, given at first every hour until three or four doses had been taken, and then smaller doses continued for a week, cured a severe case of neuralgia. In a case of fever and anorexia, in which quinine failed to give benefit, parthenin gave marked relief in twenty-four hours. *Parthenium Hysterophorus* is a common weed in Jamaica, and is highly esteemed there as a remedy for ulcerated sores and certain skin diseases, especially such as are of herpetic and pustular character.—La Cronica Medico-Quirurgica (Havana); Therap. Gazette, 1885, 359; Phar. Jour. and Trans., May 30, 1885, 987.

VALERIANACEÆ.

Valerian.—Value of a decoction used locally on wounds to relieve pains. See *Decoction* of *Valerian* under "Pharmacy."

RUBIACEÆ.

Cinchona—Cultivation in Ceylon.—A sub-committee of the Dimbula Planters' Association, appointed to inquire into the cultivation and harvesting of cinchona, have made a lengthy report as the result of their inquiries, and sum up as follows:

1. *Species and Origin.*—With regard to species and origin, succirubra and hybrids have answered best chiefly from the seed from Hakgala trees, that is, seed procured from Hakgala, from trees grown on estates there. The trees raised from Hakgala cuttings are highly spoken of by those that have them. No difference appears to have been found between seed from shaved and unshaved trees.

2. *Planting.*—Plants put into holes have answered generally best, nursery and self-grown plants being equally good. Very few have succeeded in making cinchona grow where it had died before.

3. *Cultivating.*—In cultivating, lopping and forking are generally approved of as stimulating the trees, also bulky manure; a gradual lopping of two branches at a time is considered best.

Trees are generally considered to seed early when they are unhealthy or in unsuitable soil; and there appears to be no method in vogue that has stopped the flowing of the tree. Shaving is said by the majority not to increase the tendency to seed, but by some, excessive shaving is thought to have that effect. By nearly all, cutting off the seed is said to strengthen the tree. By the majority, no difference has been noticed between trees raised from foreign and local seed, but by some that have tried it, they are considered to be less liable to canker. Canker is said by most to be caused by damp soil, and by some, by the degeneracy of the stock, and successive generations have been found by nearly all to canker more than the original; by most managers, no treatment has been found to stop canker; by some, baring the collar has been found to do good; and by some, forking.

4. *Harvesting.*—Shaving is almost universally approved as the best means of harvesting, and there is a good deal of evidence in favor of stopping shaving when the tree is five years old. Most have found commencing shaving at three years old the best, but some at two and some at four. Covering is universally approved of, grass being the best covering; while in dry weather the covering should be put on immediately after shaving, some recommending an interval between shaving and covering of two months. It appears that generally a part of the cellular bark is left on, as well as the liber, and that it is thought best to leave the covering on till the next shave. The majority are of the opinion that shaving checks the growth of the tree, especially after five years old, and in some cases it is said to kill the tree. In every case except one an increase of bark is reported between the shavings, and in some cases as much as 50 per cent., but generally speaking, about 20 per cent. Succirubra appears to give 2½ per cent. sulphate of quinine; officinalis about 1¾ per cent.; renewed succirubra about 3¾ per cent.; renewed officinalis at five years old almost 5¾ per cent., and in one case at seven years old 7 per cent. The yield of succirubra is said to be from ⅕ to ⅓ lbs. per tree. The best months for shaving are said to be March and April and September and October, and the majority approve of dry weather for covering in. Most managers report that some trees have suffered from the bark rotting after shaving, owing to this being done badly or in unfavorable weather; again, there is an equal weight of evidence as whether or not rotting occurs when trees are not covered. The majority are of opinion that trees will renew bark well if shaved after five and a half years old, and, again, most managers say that three is the greatest number of times that they have found trees renew well after shaving.

5. *Coppicing.*—Six years old is considered the best age to coppice trees, and between March and May the favorite months, while it is considered best to leave three suckers. Very few stools are said not to throw out suckers after coppicing, and from five to seven years the best interval to leave between coppicing. Coppicing trees is said generally to give three times as much bark as one shaving of them.

6. *Curing.*—Drying in the sun is generally considered the best way of curing; artificial drying by those that have tried it has been found to be unsuccessful.

Shaving twice, and then coppicing, is advised by the sub-committee as the best mode of harvesting and the best means of prolonging the life of the stock; for by this treatment (namely, coppicing) the system of the plant is reinvigorated.—Pharm. Jour. and Trans., July 26, 1884, 65.

Cinchona—Cultivation in Bolivia.—Mr. Gibbs, the British Minister to Bolivia, who has paid much attention to cinchona cultivation in that country, has communicated some very interesting information on the subject. He states that the cultivation of quina in plantations, systematically, has been carried on for about seven years, hardly long enough to show all the advantages, as there is room for much study and improvement. Mapire, about sixty leagues west of La Paz, or about five days' journey, has under cultivation about four million five hundred thousand plants; Longa, northeast of this city about twenty leagues, five hundred thousand plants; Yungas, east northeast twenty leagues, one million plants; Guaney, east of Mapire, five hundred thousand plants; total, six million five hundred thousand plants.

A tree will give from fifteen to twenty pounds of seed. The seed is collected in November and December (the early summer months here), and planted very thickly in boxes or beds about twelve feet in length and three feet in breadth, and placed on a slight decline or fall and well irrigated. When the plants are about six inches in height and have a few leaves—from five to six (which is in about five months)—they are transplanted; holes of some eight to ten inches deep are dug about six feet apart, in which they are planted. The plant is covered partly over with twigs and other light stuff, grass and leaves, to keep off the sun for about three months. When the plant is strong and healthy, the undergrowth of other plants is cleaned out and great care is taken. This attention continues for about two years, and then the plants that are left are considered sound. About 25 per cent. of the plants decay or rot in this time. Afterwards the undergrowth is cleared out once a year, and when the tree is six years old it is productive, grows to about fourteen feet in height, and has a diameter of about six inches, up to six or seven feet. Where the bark is of the most productive kind, the trunk grows straight and slender, and has the form of an orange tree. When a tree is left standing for ten or twelve years, it is over a foot in diameter, the bark is thicker and heavier, but not so productive in quinia. The bark is ready to cut when the tree is about six years old. An incision is made around the trunk of the tree a few inches from the ground, another incision some twenty-four inches above around the tree, and then two incisions opposite, lengthwise. The bark is pulled off in two pieces. Two cuts, and sometimes three, are got off each tree, twenty-two to twenty-four inches in length, and seven to eight inches in width. When removed it curls up like the cinnamon bark. After the tree is stripped it is cut down, leaving a trunk about twelve inches above the ground, and from the base, where the bark has been left, there spring out some fifteen or twenty shoots or sprouts; these are left growing until they are a little higher than the stump, then they are thinned out, leaving two or three; they grow fast and in five years give good bark.

The trees produce on an average about four and a half pounds of bark, and are stripped in the southern hemisphere, late in the spring, October to January. The bark is placed in paved yards, and is generally cured in four days, but if rain sets in, at times it takes nearly three weeks.—Amer. Jour. Phar., Jan. 1885, 38–40; from Phar. Jour. and Trans.

Cinchona—Harvesting in Java.—The "Tropical Agriculturist," after considering the advantages of the new methods of collecting cinchona bark over the older one, which required the felling of the trees, and commenting on the advantages of "mossing" over the system of "coppicing," gives an account of the manner of collecting bark in Java, from which the following is abstracted:

The laborers, among whom are not unfrequently mothers with infants at the breast—experience all the miseries of a mountain climate at an elevation of 7,000 feet. Shivering with cold, the women sit, sheltered as much as possible by a screen of plaited dried leaves, peeling the lopped branches, and cutting the wet bark to measure; the small slivers, or so-called refuse, is carefully collected in baskets.

The heavier work is performed by men; they lop the branches, or, if the "mossing system" is followed, they make incisions lengthwise in the stem, at intervals of 3 to 5 or more centimetres, according to the thickness of the tree, and then strip the stem from below upwards to where the branches begin, but in such a manner that strips of bark of equal breadth are left alternately on the stem, by which it assumes somewhat the appearance of a fluted column. The strips of bark are then cut into lengths of 50 centimetres, and the stem, which is partially denuded lengthwise, is entirely enveloped, as is done in Europe to some trees that could not bear exposure to our winters. McIvor, at Madras, did this first with moss, and hence the name "mossing;" but as this material was soon exhausted in Java, recourse was had to alang-alang, indjoek or dried grass, which occurs in great abundance.

In the course of one year this envelope is removed, then the healing—granulation we should say—the renewing of the bark is begun, and now comes the turn of the strips left on the tree the preceding year to be stripped off. Then the stem is again bandaged.

The wet bark, after being cut to measure, is dried, either in the sun or artificially, by which the pieces roll up in their breadth, and thus form the familiar pipes. The packing is generally in jute-bags. They weigh about 75 kilograms.

From chemical investigation it has been proved that drying in the sun or by artificial heat is the same for the bark, and has no influence on the proportion of quinine.—Amer. Jour. Phar., Jan. 1885, 40–42, from Phar. Jour. and Trans., Nov. 22, 1884, 410.

Cinchona Bark.—Determination of the character of the "*Fat*" or "*Wax*," which see under "Organic Chemistry."

Remijia Pedunculata and *R. Purdieana—Microscopical Distinctions.*—Professor G. Planchon points out the microscopical distinctions between the ordinary cuprea bark (*Remijia pedunculata*) and the cinchonamine bark (*R. Purdieana*). The chief difference is in the presence, in the parenchymatous zone of the bark, of a number of stony cells, which are crowded in numerous and well-developed radial lines, which end abruptly in *R. Purdieana.* These cells are very few and distant, and all the cells have thinner walls. The presence of the stony cells in the latter cannot be seen with an ordinary lens, although readily visible in *R. pedunculata.*—Jour. de Phar. et de Chim., Nov. 1884, 428; Phar. Jour. and Trans., Dec. 27, 1884, 504.

Remijia Purdieana.—For a description of the alkaloids of the bark see *Alkaloids* under "Organic Chemistry."

Cuprea Bark.—Occurrence of *Homoquinine* and conversion of this into *Quinine.* See under "Organic Chemistry."

Red Bark—Importance of Selection of Species for Cultivation.—Several years ago, Mr. Robert Cross called attention to the mistake which had been committed in planting at Naduvatum and other places on the Nilgiri hills a comparatively useless cinchona, the Huanuco bark of Peru, for the true "red bark" of Chimborazo, *Cinchona succirubra.* The correctness of this statement having been questioned, Mr. Cross now reiterates it with the remark that, after having dressed and transplanted the original stock of "red bark" plants *twice* in their native forest, he would just as likely be liable to mistake his own handwriting.

To show the importance of selection of species, as well as the influence which the age of the plant has on the yield of alkaloids, Mr. Cross collected, while in India, a little of the bark of two varieties of true "red bark," together with a few samples of "crown" bark. In India, as in South America, two distinct varieties of "red bark" are observed. One of these, which possesses smooth foliage, is called by South American collectors *pata* bark; while to the other, the leaves of which are hairy underneath, the term *teja* or "tile" bark is applied. These sorts are not kept separate in commerce. The *pata* sort, however, seems to inhabit a rather higher zone on the mountain slope, and so may prove hardier than the other. Probably both varieties are of equal merit as quinine-producing plants.

The samples collected by Mr. Cross were examined by Mr David Howard with the following results:

Number	Analysis of samples referred to by D. Howard, Esq., F. C. S.	Quinine sulphate, per cent	Quinine alkaloid, per cent	Cinchonine alkaloid, per cent.	Cinchonidine alkaloid, per cent.	Quinidine alkaloid, per cent . . . . . .
1	True "red bark," *C. succirubra, Teja*, or "tile" variety of South American bark collectors, one year old renewed bark	5.32=	4.00	1.42	0.66	0.14
2	True "red bark," *C. succirubra*, "tile" variety, two years old renewed bark	4.40=	3.30	trace	0.23	0.06
3	True "red bark," *C. succirubra, Pata* variety, one year old renewed bark	5.68=	4.26	trace	0.08	0.08
4	True "red bark," *C. succirubra, Pata* variety, two years old renewed bark	5.82=	4.37	trace	0.32	0.17
5	"Crown," one year old renewed bark	2.60=	1.95	trace	trace	0.18
6	"Crown," two years old renewed bark	3.10=	2.33	0.17	0.06	0.17
7	"Crown," three years old renewed bark	7.64=	5.23	0.38	0.48	0.66
8	"Crown," four years old renewed bark	8.80=	6.60	trace	0.12	0.37
9	"Crown," apparently original bark. Tree twelve years old	12.30=	9.22	0.00	0.12	0.64
10	Root bark from large primary roots of true *C. succirubra, Fata* tree, 20 feet high.	4.68=	3.51	2.10	2.26	0.77
11	"Crown," a variety with small leaves, the *Paramo* bark of Loxa collectors, three years old renewed bark	6.28=	4.69	1.03	0.48	0.34

The author draws attention to the small proportion of inferior alkaloids contained in the bark when compared with the yield of quinine, and points out that when really good sorts of trees are properly cultivated and carefully managed, a steady yield of the alkaloids may be relied on.—Amer. Jour. Phar., Feb. 1885, 97–99; from Phar. Jour. and Trans., Dec. 13, 1884, 463.

Referring to the above reiteration of Mr. Cross, Mr. W. T. Thistleton Dyer expresses regret that Mr. Cross should have re-opened a question which he supposed had been practically laid to rest. In contradiction of Mr. Cross' views, Mr. Dyer quotes voluminously from various papers and reports made to the government by such authorities as Mr. Clements Markham, Surgeon Major Bidie, Mr. Grand Duff (Governor of Madras), Sir. Joseph Hooker, and others, which clearly support his view as to the incorrectness of that held by Mr. Cross.—Ibid., 92–96.

Coffee.—Percentage of Caffeine of Commercial Grades and Effect of Roasting on the Same. See *Caffeine*, under "Organic Chemistry."

Brazilian Coffee—Percentage of Caffeine in Fifteen Samples.—The students of Professor Dragendorff's laboratory have analyzed fifteen samples of Brazilian coffee from the International Horticultural Exhibition held in St. Petersburg in 1884, with results which appear to vary within narrow limits. They may be stated as follows:

Caffein	0.99	to	1.22%
Tannin	5.46	"	7.60%
Albuminoids	19.86	"	24.78%
Fixed oil	13.50	"	16.48%
Ash	2.92	"	4.24%
Phosphoric acid	0.28	"	0.49%

Professor Dragendorff considers that these results show that as food material Brazilian coffees do not fall behind other kinds; but there seems to be some doubt as to the aroma. The volatile oil observed was in too minute quantities to allow of investigation; but in some cases, and especially in the case of inferior samples, it had an odor peculiar to Brazilian coffee.—Phar. Jour. and Trans., May 30, 1885, 986; Phar. Zeitschr. f. Russl., xxiv., 116.

Roasted Coffee—Percentage of Caffeine.—According to a recent report in the Allg. Kaffee-Zeitung (Rotterdam), the percentage of caffeine in different varieties of roasted coffee is, on an average, as follows:

Brazil (Amarello)	3.64
Martinique	3.58
Alexandria	2.52
Java	2.52
Mocha	2.12
Cayenne	2.00

—Amer. Drug., Aug. 1884, 155.

Gambier—Production, etc., in Johore.—Among the collection of products exhibited in the Edinburgh Forestry Exhibition by the Maharajah of Johore, there were five kinds of gambier, to which Mr. Peter Macewan calls attention. The cultivation of this product in Johore does not differ from the methods pursued in the Straits settlement, that is to say it is cultivated along with black pepper. The plant cultivated is presumably *Uncaria Gambier;* whether other varieties are under cultivation or not is doubtful. Of the five kinds of gambier exhibited, three are of cube form, one disc shaped, and the other oblong (*parallelopiped gambier.*) One of the cube specimens (which proved to be the best of its kind) is labelled "Gambier, *Makan*, for eating." The oblong variety is designated "Gambier *Paku.*" The disc-shaped kind is stated to be "first quality for eating." The author has found the cube gambier to be of excellent quality and far superior to some commercial samples examined. The *first quality* ("Makan") occurred in fairly regular cubes, averaging

8.475 grams in weight, externally cassia brown, internally pale cinnamon brown, yielding 3.96% of ash and 32% of tannin (calculated as gallotannic acid) by Lowenthal's method. The *second quality* was in badly formed cubes, averaging 13.53 grams in weight, externally brown black, internally cinnamon brown, yielding 4.48% ash, 30% tannin. The *third quality* occurred in well-shaped cubes, averaging 10.24 grams in weight, externally dull brown, internally pale brown, yielding 10.76% of ash and 19.7% of tannin. The Johore *parallopipeds* have only about half the measurements of the specimen described by Pereira in his "Materia Medica," and the color is of a uniform dull brown externally, and drab internally. It is exceedingly hard and strong. It incinerates with difficulty, even when powdered, yielding 60.6% of ash. The content of tannin is exceedingly small, viz., 2.08%. The *cylindrical* (or disc-shaped) gambier is a little larger than that described by Pereira. The average diameter is 37 mm. and thickness 6 mm. It also differs from his in the density; his sank in water, but the Johore variety is very light and floats on water. The average weight of the discs is 3.28 grams. The color approaches to Pereira's description. A peculiarity of the Johore discs are the ring markings on the surface. Some have two, others one ring only, about a third of an inch from the edge, and the same distance apart when there are two. This gambier incinerates easily and yields only 1.63% of ash, which is remarkable, the smallest percentage hitherto found in fine gambier being 2.6%. The percentage of tannin (20%) is also low, yet the author has failed to find any adulterant in it. He considers it to the contrary, probable that the sample has been prepared with unusual care from clean leaves, the explanation of the low tannin content being that the decoction has not been subjected to prolonged boiling, which favors the decomposition of catechin, with formation of catechutannic acid.—Phar. Jour. and Trans., March 28, 1885, 793–795.

Doundaké Bark—Source, Constituents and Medicinal Value.—Messrs. Haeckell and Schlagdenhauffen have made some recent researches which indicate that the plant which yields "doundaké bark" is identical with that yielding the root sometimes exported from West Africa under the name of "peach root," viz:

Sarcocephalus Esculentus, Afz. (*Cephalina Esculenta*, Schum.) They consider it an astringent and febrifuge capable of replacing cinchona bark, and also regard the beautiful yellow color as worthy of the attention of dyers. The doundaké appears to extend from 16° N. to 5° S. latitude, from Senegambia to the Gaboon, and is known in the Souson tongue as "doundaké," in the Toucouleur as "jadali," in the Bassa country as "dorg," and in Sierra Leone as "amelliky." The author states that with doundaké bark those of certain species of *Morinda* (*M. citrifolia*, L., *M. longiflora*, G. Don., and *M. doundaké*) are sometimes mixed. They, moreover, describe two varieties of doundaké bark, the one from Sierra Leone and the other from Boké (Rio Nuñez). The young bark of the first has a greyish, smooth surface, here and there cracked, and presenting small, hard, distant excrescences of a darker color. When older the bark becomes blackish, the cracks multiply, and the epidermis falls off as a reddish dust. The interior of the bark is of an ochrey yellow, and is striated longitudinally. The liber fibres separate easily in lamellæ. The bark has a bitter taste and tinges the saliva yellow. The epidermis and corky layer are astringent only. The Boké bark differs in the absence of the blackish excrescences, and the internal surface is of a darker yellow. The epidermal layer is less astringent and the liber more bitter, but the anatomical structure is identical. The authors have not been able to obtain the alkaloidal principle indicated by Messrs. Bochefontaine, Féris and Marcus. They have found that the bitterness of the bark is due to two nitrogenous coloring principles of a resinoid character, differing in their solubility in alcohol and water, and having the formulæ $C_{28}H_{19}NO_{13}$ and $C_{19}H_{16}NO_9$. The other constituents found in the bark are a tasteless principle, soluble in caustic potash, glucose, and traces of tannin.—Compt. Rend. C. 69; Pharm. Jour. and Trans., Jan. 31, 1885, 614.

Hymenodictyon Excelsum—Character of Alkaloidal Constituent.—See *Hymenodictyonine*, under "Organic Chemistry."

Pinckneya Pubens—Mich.—*Absence of Alkaloid and Occurrence of a Glucoside.*—Mr. E. H. Naudain, having secured a small supply of authentic "Georgia bark," in which bark Dr. Farr had announced (1881) the presence of an alkaloid identical with cinchonine, subjected the bark to chemical examination. The bark obtained was in quills about two inches in length, from $\frac{1}{16}$ to $\frac{1}{8}$ inch in thickness; externally, of an ash-gray color, and somewhat warty; internally, brownish-white, of a distinctly bitter taste, and breaking with a short, corky fracture. Besides unimportant constituents, among which considerable oxalate of calcium, the author separated a small quantity of a distinctly crystalline substance, which proved to be a glucoside, and for which he proposes the name of "pinckneyin." No reactions for an alkaloid were obtained by the usual alkaloidal reagents, nor could such be separated by well-known methods for the separation of alkaloids. The author is therefore of the opinion that Dr. Farr's observations were incorrect.—Amer. Jour. Phar., April 1885, 161–163.

Galium Pilosum, Ait., var.—*Medicinal Uses in the South.*—Dr. E. W. Lane reports on this plant, commonly called "hairy bed-straw," under the name of "snake-bite-weed," "flux-weed," and the absurd name "four-corners-of-the-earth," which last it has probably received in allusion to its four-angled stem. It is one of the innumerable weeds, of which every village has one or more, said to be a specific for the bite of the rattlesnake and other venomous creatures, and without much doubt worthless in this respect. Belonging to a family which yields the cinchonas and other powerful stimulants, and being so near to the *Galium aparine*, L., it very possibly has medicinal properties ; but the objection to the property here proposed rests on our knowledge of the nature of the rattlesnake's venom.—Dr. H. H. Rusby, in Am. Jour. Phar., Feb. 1885, 90.

UMBELLIFERÆ.

Conium Maculatum—Alkaloidal Content of the Root.—Mr. Lepage gives the results of some experiments which confirm the conclusion arrived at by Orfila, that the root of *Conium maculatum* contains only a small quantity of alkaloids. In these experiments a series of alcoholic extracts of fresh and dried roots was examined, and distillates from dry roots were treated directly for the alkaloids. Mr. Lepage found that the roots collected in March from only partially developed plants contained extremely small quantities of alkaloids. The same result was obtained with roots collected in May, although the plants were then in full growth and the leaves and stalks contained a notable quantity of alkaloid. Roots collected toward the end of June gave no better yield, but the roots of the first year's plants collected in September were found always richer in alkaloid than those of the second year. The largest quantity of conicine was met with in the fruit. No alkaloid was found in the oil obtained by distillation from the root, but oil derived from the leaves, stalks or fruit contained a considerable quantity.—Jour. de Phar. et Chim, (5) vi., 10 ; Phar. Jour. and Trans., Jan. 31, 1885, 614.

Sanicula Marilandica, Lin.—*Proximate Examination of the Root.*—Mr. Calvin I. Houck has subjected the root of this plant, which abounds in the interior of Pennsylvania, to proximate examination. The root is short and thick, with many rootlets, has a slight odor when fresh, which becomes more persistent by long keeping, and is light brown in color, but becomes black after drying. It is collected during the month of August, and loses one-fourth (?) of its weight by drying. When boiled, the bark is detached, exposing the thin, white inner root. The root when chewed is strongly acrid, and pungent, and quite aromatic, but leaves a very unpleasant sickening sensation on the tongue and fauces, remaining for a long time. It is an expectorant and diaphoretic ; sometimes used in intermittent fever, also in chorea. In the interior of Pennsylvania, it is extensively used in domestic practice for pulmonary affections, with satisfactory results.

The author's analysis shows it to contain an abundance of volatile oil and resin, upon which its virtues probably depend. Besides these he proved the presence of tannin, gum, starch, coloring matter and extractive. The ash, amounting to about 10%, contained phosphate and carbonate of potassium, calcium, magnesium and iron. An alcoholic tincture seems to contain all the desirable constituents of the drug.—Amer. Jour. Phar., Sept. 1884, 463–464.

ARALIACEÆ.

Ginseng—Cultivation.—Consul-general Aston has visited several of the numerous ginseng gardens near Songdo, Corea. The seed is sown in March; the seedlings are planted out in beds raised a foot above the level of the surrounding soil, bordered with upright slates and covered in from sun and rain by sheds of reeds 3 or 4 feet high, towards the north left more or less open according to the weather, and placed in rows with just room enough to walk between them. During the first and second year the plant has only two leaves and is frequently transplanted, in the fourth year the stem is about six inches high with four horizontal leaves, and in the fifth or sixth year the plant has reached maturity. Mould containing plenty of rotted leaves is the only manure used. The root is either dried in the sun or, during unfavorable weather, over a charcoal fire; or to make the red or clarified ginseng it is placed in wicker baskets which are put in a large earthenware vessel with a closely-fitting cover and pierced at the bottom with holes. It is then placed over boiling water and steamed for about four hours. The export of this quality of ginseng is a strict monopoly, and death is the punishment for smuggling it out of the country. The annual amount exported to China is 202 piculs, valued at forty dollars a picul (133½ lbs.). The white ginseng is worth about half as much. It is the wild ginseng for which enormous prices are sometimes paid.—Amer. Jour. Phar., June 1885, 307; Phar. Jour. and Trans., March 7, 1885, p. 732.

RANUNCULACEÆ.

During the past eighteen months Messrs. J. W. and C. G. Lloyd, have issued a periodical publication, unique in its character, entitled "Drugs and Medicines of North America," in which they endeavor to give a complete account of all the facts that have been made known in reference to the drugs under consideration, together with such additional facts and observations as they may have determined by their own experiments and studies, or by the aid of co-workers. The very exhaustive manner in which each subject is treated must prevent abstraction for this report in the usual manner, but the importance of the work demands that such notice should be taken of the drugs considered by the authors, that reference may be had in the original to any particular subject connected with them. The six numbers that have so far appeared are devoted exclusively to drugs derived from the "Ranunculaceæ," which may be referred to as follows:

Clematis Virginiana.—Parts used. Botanical analysis. Common names. Specific description. Generic description. Allied species (*C. Viorna*, L.; C. *Pitcheri*, Torr.; *C. crispa*, L.; *C. verticillaris*, D. C.; *C. ligusticifolia*, Nutt; *C. vitalba*, L.; *C. recta* (*erecta*), L.; *C. viticella*, L.; *C. dioica*, L.) Description of drug. Microscopic structure (bark, wood and pith). Constituents. Medical history. Pharmaceutical preparations. Medical properties. Dose. Literature. Illustrations: Plate I., *Clematis Virginiana*, flowering branch, natural size. Fig. 1, Branch of *C. crispa*. Fig. 2, stem of *Clematis Virginiana*, natural size. Plate II., microscopic structure of the stem of *Clematis Virginiana*, pp. 1–15.

Thalictrum Dioicum.—Part used. Botanical history. Allied species. (*T. purpurascens*, L., and *T. cornuti*, L.). Medical history and properties. Foreign species (*T. flavum*, *T. magus* and *T. siense*). Literature. Illustrations: Fig. 3, leaf of *Thalictrum dioicum*, pp. 15–17.

Thalictrum Anémonoides.—Parts used. Botanical analysis. Common Names. Botanical description. Medical history and properties. Pharmaceutical preparations. Literature. Illustrations: Fig. 4, tuberous roots of *T. anemonoides*. Fig. 5, fruit-head of *T. anemonoides*. Plate III., *T. anemonoides*, natural size, pp. 17–21.

Anemone nemorosa.—Part used. Description. Allied species. (*A. Virginiana*, L.; *A. cylindrica*, Gray; *A. dichotoma*, L.). Characteristics. Constituents. Preparations. Medical history. Medical properties. Dose. Literature. Illustrations: Fig. 6, *A. nemorosa* (the entire plant); Fig. 7, fruit-head of *A. Virginiana*; Fig. 8, fruit-head of *A. dichotoma*, pp. 21–25.

Anemone Patens.—Officinal part. Botanical analysis. Common names. Botanical description. Botanical history and synonyms. Allied species (*A. Alpina*, L.). Characteristics. Commercial history. Constituents. Medical history. Medical properties. Pharmaceutical preparations. Dose. Literature. Illustrations: Fig. 9, achene of *A. patens*, var. *Nuttalliana*; Plate IV., *A. patens*, var. *Nuttalliana*, natural size, in fruit and flower, pp. 25–37.

Hepatica.—The dried plant of *Anemone acutiloba*, Lawson, and *A. hepatica*, L. Botanical analysis. Common names. Description. *A. hepatica*. *A. acutiloba*. Geographical distribution. Description of the drug (Sharp-lobed domestic drug; Blunt-lobed domestic drug; Foreign drug). Microscopic structure. Commercial history. Pharmacopœial history. Constituents. Pharmaceutical preparations. Medical history. Medical properties. Dose. Literature. Illustrations: Plate V., *A. acutiloba*, natural size; Fig. 10, flower of *A. acutiloba*; Fig. 11, stamen, petal and achene of *A. acutiloba*; Fig. 12, fruit of *A. acutiloba*; Fig. 13, extreme forms of leaves of *A. acutiloba* and *A. hepatica*; Fig. 14, abnormally-developed flowers of *A. acutiloba*; Plate VI., map showing the distribution of *A. hepatica* and *A. acutiloba*; Fig. 15, sharp-lobed American hepatica leaf, *A. acutiloba*; Fig. 16, blunt-lobed American hepatica leaf, *A. hepatica*; Fig. 17, imported hepatica leaf, *A. hepatica*, pp. 37–54.

Ranunculus bulbosus.—Parts used. Botanical analysis. Common names. Specific description. Allied species (*R. acris*, L.; *R. repens*, L.; *R. sceleratus*, L.; *R. abortivus*, L.). Characteristics. Constituents (anemonin, anemonic acid, anemoninic acid, anemonol—oil of anemone). Pharmacopœial history. Medical history. Medical uses. Literature. Illustrations: Plate VII., *R. bulbosus*, natural size; Fig. 18, petal and section of leaf-stalk of *R. bulbosus;* Fig. 19, leaf of *R. bulbosus;* Fig. 20, leaf of *R. acris;* Fig. 21, leaf of *R. repens;* Fig. 22, flower of *R. sceleratus;* Fig. 23, *R. abortivus*, natural size; Fig. 24, different forms of anemonin, as crystallized from chloroformic solutions, pp. 54–73.

Calthus Palustris.—Part used. Common names. Description. Constituents. Pharmaceutical preparations. Medical history and properties. Literature. Illustrations: Fig. 25, fruit of *C. palustris;* Fig. 26, flowering top of *C. palustris.*—pp. 74–75.

Hydrastis Canadensis. — Part used. Botanical analysis. Common names. Botanical description. Botanical history. Geographical distribution. Description of the rhizome. Microscopical structure (Rhizome; Starch grains; Root). Commercial history. Variation in supply. Fluctuations in price. The supply. The past and present supply. Consumption of hydrastis. Export of hydrastis. Adulterations. Constituents. *Berberine.* History of berberine. Processes for the preparation of berberine. Preparation of berberine. Identity with the berberine from *Berberis vulgaris.* Composition. Properties. Solubilities. Decomposition products. Salts of berberine. *Muriate* or *hydrochlorate of berberine.* Alkaloidal nature of muriate of berberine. Preparation. Action of nitric acid, of sulphuric acid, of hydrochloric acid, of acetic acid. of hydroxide of ammonium, and of the hydroxides of potassium or sodium on hydrochlorate of berberine; Solubilities; Incompatibles; *Mono-Berberine sulphate* (Bi-sulphate of berberine): Preparation; Description; Action of reagents; Solubilities; Incompatibles; *Di-Berberine sulphate* (Normal sulphate of berberine): Preparation; Properties; *Phosphate of berberine:* Analysis and properties; Preparation; Gravimetric estimation; Volumetric estimation; Properties; Solubilities; *Nitrate of berberine:* Preparation; Properties; *Citrate of berberine:* Solubilities; *Picrate of berberine:* Detection and estimation of berberine. *Hydrastine* (the white alkaloid of *Hydrastis canadensis*): History; Preparation; Chemistry; Properties; Action of reagents; Decomposition products; Solubility; Salts of hydrastine; Yield of hydrastine and berberine from *Hydrastis canadensis;* Hale's "*Third Alkaloid of Hydrastis;*" History; Method of separation; Other constituents of hydrastis; *Powdered hydrastis:* Appearance; Estimation of berberine; Detection of curcuma. Pharmaceutical preparations; Fluid extract; Fluid extract without alcohol; Tincture; Essence.

Medical history. Medical properties. Literature. Illustrations: Plate VIII, *Hydrastis canadensis;* Fig. 27, flower-bud of *H. canadensis;* Fig. 28, fruit of *H. canadensis;* Plate IX, map showing the distribution of *H. canadensis;* Fig. 29, dried rhizome of *H. canadensis;* Plates X and XI, microscopic structure of the root and rhizome of *H. canadensis;* Fig. 29, root of *Stylophorum diphyllum* (adulterant); Fig. 30 (omitted in the text.—Rep.); Figs. 31, 32, and 33, crystals of berberine; Fig. 34, crystals of hydrochlorate of berberine; Fig. 35, crystals of mono-berberine sulphate; Figs. 36 and 37, crystals of bi-berberine sulphate; Fig. 38, crystals of phosphate of berberine; Fig. 39, crystals of citrate of berberine; Figs. 40, 41, and 42, crystals of hydrastine; Fig. 43, crystals of Hale's "Third Alkaloid." — pp. 75–184.

Trolius Laxus—Description. Medical properties. Illustrations: Plate XII, *T. laxus*, Fig. 44, stamens and section of carpel of *T. laxus*, Fig. 45, pistils of *T. laxus;* pp. 186–188.

Coptis Trifolia.—Part used. Botanical analysis. Common names. Botanical description. Botanical history. Geographical distribution. Allied species (*C. occidentalis*, Torr. and Gray; *C. asplenifolia*, Salisb.) Description of the drug. Microscopical structure (Rhizome, root; Leaf; Stem of the leaf.) Commercial history. Pharmacopœial history. Constituents (Berberine; Second alkaloid of coptis—coptine;) Pharmaceutical preparations. Medical history and properties. Illustrations; Plate XIII, *Coptis trifolia;* Fig. 46, flower of *C. trifolia* and petal Fig. 47, fruit of *C. trifolia*, and longitudinal section of carpel; Plate XIV, map showing the distribution of *C. trifolia;* Fig. 48, *C. occidentalis* —flowering plant; Fig. 49, flower of *C. occidentalis;* Fig. 50, fruit of *C. occidentalis;* Fig. 51, flower of *C. asplenifolia;* Fig. 52, front and reverse view of the petal of *C. asplenifolia;* Fig. 53, fruiting plant of *C. asplenifolia;* Fig. 54; Plate XV, Figs. 55, 56, 57, 58, 59, 60, 61, 62, showing the microscopic structure of the rhizome, root, leaf and leaf stem, of *Coptis trifolia.* pp. 188–208. Incomplete.

Hydrastis Canadensis—Yield of Hydrastine and Berberine from the Commercial Powder.—As part of a series of investigations on Hydrastis canadensis conducted in the laboratory of Prof. J. U. Lloyd, Mr. W. Simonson has determined the quantity of hydrastine in 48 samples of the commercial powdered rhizome. His results are given along with the determinations of berberine in the same samples by Mr. Leslie Soule, who prepared the tincture from the drugs under examination, and whose results have been already communicated in No. 5 of Drugs and Medicines of North America (p. 146). Mr. Simonson's results are tabulated as follows:

Sixty Parts of Powdered Hydrastis.

Specimen No.	Yielded of hydrastine in parts.	Equalling per cent. hydrastine.	Yielded of berberine hydrochlorate in parts.	Equalling per cent. berberine hydrochlorate.
1	.095	.158	1.34	2.23
2	.129	.215	1.355	2.22
3	.101	.168	1.26	2.10
4	.081	.135	1.25	2.08
5	.095	.158	1.25	2.08
6	.068	.113	1.23	2.05
7	.031	.051	1.21	2.02
8	.094	.156	1.19	1.98
9	.072	.12	1.19	1.98
10	.072	.12	1.18	1.96
*11	. .	. .	1.16	1.93
12	.091	.151	1.15	1.91
13	.044	.073	1.12	1.86
14	.076	.126	1.12	1.86
15	.084	.14	1.10	1.83
16	.066	.11	1.10	1.83
17	.099	.165	1.10	1.83
18	.028	.046	1.08	1.80
19	.054	.09	1.08	1.80
20	.054	.09	1.08	1.80
21	.067	.111	1.08	1.80
*22	. .	. .	1.08	1.80
23	.044	.073	1.05	1.75
24	.069	.115	1.04	1.73
25	.039	.065	1.04	1.73
26	.040	.066	1.01	1.68
27	.098	.163	.98	1.63
28	.070	.116	.97	1.61
29	.034	.056	.97	1.61
30	.111	.185	.97	1.61
31	.091	.151	.94	1.56
32	.063	.105	.94	1.56
33	.055	.091	.91	1.51
34	.088	.146	.90	1.50
35	.088	.146	.85	1.41
36	.032	.053	.83	1.38
37	.108	.18	.83	1.38
38	.128	.213	.79	1.31
39	.106	.176	.70	1.16
40	.129	.215	.70	1.16
41	.053	.088	.62	1.03
42	.063	.105	.61	1.01
43	.101	.168	.57	.95
44	.044	.073	.54	.90
45	.088	.146	.35	.58
46	.028	.046	.31	.51
47	.087	.145	.24	.40
48	.051	.085	.21	.35
49	.048	.08	.205	.34
50	.143	.238	. .	. . †

* Hydrastine not estimated.

† Berberine not estimated

Specimen number 50 was powdered from select clean rhizomes freed from rootlets, and it will be noticed that this furnished the largest yield of hydrastine.

The average yield of hydrastine for the entire number of specimens is .125 per cent. For the first seven (those containing at least 2 per cent. of berberine), it is .143 per cent. The latter quantity is nearly identical with that obtained from a standard specimen of fresh hydrastis, which yielded .140 per cent. A close inspection of the table will show, however, that there is no fixed relation between the yield of hydrastine and that of berberine. Thus, in number 7, the quantity of berberine was forty times that of hydrastine, while in number 47 it was less than three times that of hydrastine. These proportions are corroborated by the relative yields of the two alkaloids obtained on the manufacturing scale, some lots of hydrastis being nearly worthless as regards herberine, but containing a correspondingly increased amount of hydrastine.

Although, at present, the percentage of berberine is to be accepted in judging the quality of the drug, it may become necessary to determine also the quantity of hydrastine present, if, as appears to have been proven by the physiological investigations of Prof. Bartholow, Sattler, and others, hydrastine, and not berberine, is the peculiar active constituent of hydrastis.—Amer. Drug., May 1885, 84.

Aconitum Napellus, *A. Ferox*, and *A. Japonicum*.—Constitution of alkaloidal constituents. See *Aconite Alkaloids* under "Organic Chemistry."

Aconitum Lycoctonum—Alkaloidal Constituents.—Messrs. Dragendorff and Spohn have reinvestigated the alkaloids of *A. Lvcoctonum*, which were described by Hubschmann twenty years ago under the names of *lycoctonin* and *acolyctin*, and which subsequently were believed by Messrs. Wright and Luff to be identical with *aconine* and *pseudaconine*, the decomposition products of *aconitine* and *pseudaconitine.* The authors now find that they are in point of fact decomposition products, though not of aconitine and pseudaconitine, but of two hitherto unnoticed alkaloids peculiar to *A. lycoctonum*, which they have named *lycaconitine* and *myoctonine*, represented by the formula $C_{27}H_{34}N_2O_6$ and $C_{27}H_{30}N_2O_8$ respectively. Physiologically lycaconitine is an energetic poison, resembling curare in its action, but unsuitable for therapeutic purposes, being only imperfectly absorbed by the stomach.—Phar. Jour. and Trans., Aug. 1884, 82; Phar. Zeitschr. f. Russ., xxiii., 313.

Cimicifuga Racemosa—Proximate Analysis of the Fresh Rhizome.—Mr. Milton S. Falck has subjected the fresh rhizome of *Cimicifuga racemosa* to proximate analysis and obtained results, which, while not conclusive, throw some additional light upon the nature of the active constituent and other components of the drug. Two portions, 5 grams each of the fresh rhizome and rootlets were dried: one spontaneously, the other in a desiccator. That portion dried spontaneously lost 52.5 per cent., that in the desiccator 54.5 per cent. of moisture. One gram of the powdered air-dried drug at 100° C. lost 7.8 per cent. of moisture. This upon being incinerated at a low heat, yielded 6.8 per cent. of a grayish-white ash; of this ash, 1.3 per cent. was soluble in water, consisting of potassium and sodium as chlorides and sulphates; 3.6 per cent. soluble in hydrochloric acid, consisting of calcium, iron, and magnesium as carbonates and phosphates; 4 per cent. soluble in sodium hydrate, consisting of combined silica, and 1.5 was insoluble in water, hydrochloric acid and sodium hydrate.

An infusion of the drug upon evaporating and cooling became slightly gelatinous. The infusion yielded precipitates with nitric acid, copper sulphate, lead acetate, silver nitrate, mercuric chloride, ammonium oxalate and gelatin; it became blue with iodine, and reduced Trommer's solution.

The percolate, made with cold water, was of a yellowish-brown color, at first clear, but soon became cloudy and upon evaporating yielded 23.5 per cent. of a brownish-black extract. The alcoholic percolate was of a clear golden yellow color, and upon evaporating yielded 12.5 per cent. of yellowish-brown extract.

Wax was found in small quantities, by treating the resin exhausted by alcohol, with chloroform. Resin was obtained by exhausting the drug with alcohol, evaporating and pouring the concentrated tincture into water, collecting the precipitate, washing and drying. The resin had a brownish-yellow color, was without odor, but had a slight taste, was soluble in alcohol, ether and chloroform, partly soluble in cold and hot solutions of potassa, and insoluble in benzin, hot and cold water. After treatment with animal charcoal the resin was of a yellowish-green color, and when incinerated left a grayish-white ash.

The distillate obtained by cohobation from 26 pounds of the fresh drug, was milky and had the odor of the drug, but no separation of volatile oil occurred, though the top of the bottle which contained the distillate, appeared greasy when the water was shaken. Portions of this distillate were then agitated with ether, chloroform and deodorized benzin, and set aside. After twenty-four hours that agitated with benzin had a whitish snow-like substance floating upon the top, while that which had been agitated with chloroform had separated the substance at the bottom of the vessel, and no similar separation was observed in the portion of the distillate agitated with ether.

The floating mass, collected from the distillate agitated with benzin, appeared like minute globules, and after freeing it as much as possible from benzin and water, and evaporating it to dryness, the residue weighed .025 grams and was a fine grayish-white powder without odor or taste, soluble in alcohol, slightly soluble in benzin, benzol and stronger ether, insoluble in water.

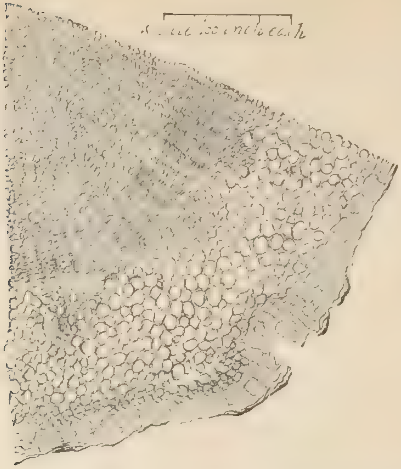
Ten pounds (avoir.) of the fresh drug was placed in an hydraulic press (power 4,000 pounds to the square inch). From this pressure there resulted one pint and a half of dirty-brown colored liquid, which after filtering was blackish-brown, and on evaporating yielded 4.252 grams of brownish-black extract. Treated in the manner stated by T. E. Conard ("Am. Jour. Phar., 1871, p. 152,") the crystalline substance described by him, was obtained, the properties of which differed in the following particulars: It was insoluble in hydrochloric acid, but soluble in sulphuric and dilute sulphuric acids. Strong sulphuric acid, when in contact with it for a little time, gave it a brown color, which upon the addition of a few drops of solution of bichromate of potassium was changed to a permanent yellow. An alcoholic solution was neutral, or, if anything, slightly alkaline to test paper, and when concentrated and poured into water gave a white precipitate which was insoluble in the alkalies. The fumes from the substance when fused with pure potassa, in a test tube, colored red litmus-paper blue, and gave rise to white fumes when a rod moistened with hydrochloric acid was passed partly into and over the top of the tube. The substance fuses at a moderate heat, and is entirely dissipated at a red heat. A precipitate was obtained when a solution of the substance in alcohol was treated with an alcoholic solution of chloride of gold and sodium, also when an acid solution was treated with an aqueous solution of chloride of gold and sodium. An acid solution when treated with phosphomolybdic acid gave a precipitate. An acid solution (the acid solutions all made with dilute sulphuric acid) gave with solution of iodo-hydrargyrate of potassium a precipitate. A precipitate was gotten from an alcoholic solution by adding an aqueous solution of tannin; care must be taken not to add sufficient to get a precipitate with water in the test solution. From the above tests and the examination with the microscope which the author has made of this substance, isolated from *Cimicifuga racemosa*, he judges it to be an alkaloid.—Amer. Jour. Phar., Sept. 1884, 459–463.

MAGNOLIACEÆ.

Illicium Floridanum—Histological Investigation.—Mr. Henry C. C. Maisch has contributed the results of a very complete histological investigation of *Illicium Floridanum*, Ellis, a shrub or small tree growing in swamps in Florida, Alabama and westward to Mississippi. It is popularly known as Southern star-anise, Florida stink-bush and poison-bag. It is said that the bark may be used a substitute for cascarilla. The leaves are poisonous. The author gives the results of his investigations as follows:

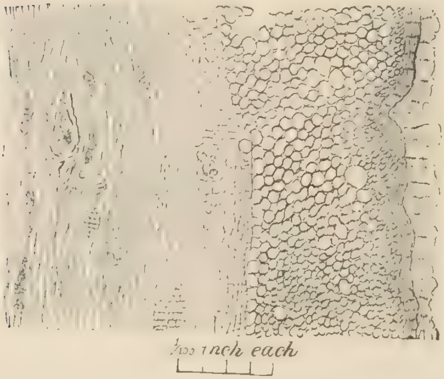
Root.—The root on cross-section, shows the bark and wood to be about the same thickness, and also the absence of pith. The cork cells (Figs. 36 and 37) are flattened and tangentially elongated. The bark is composed of large thin-walled parenchymatous cells, the small ones being near the cambium and constituting the inner bark, through which the

FIG. 36.



Illicium Floridanum. Root. Transverse Section.

FBG. 37.

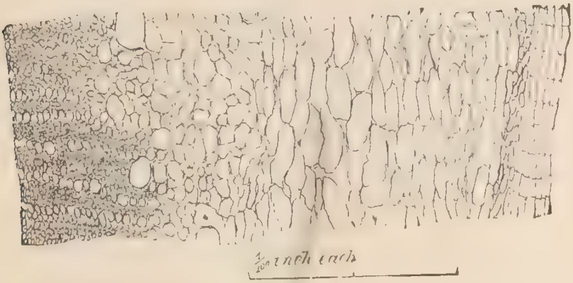


Illicium Floridanum. Root. Longitudinal Section.

medullary rays pass. The cells of the rays are larger than the surrounding bast parenchyma, and in the outer liber layer gradually increase in size to that of the cells in the primary outer bark. The secondary bark contains no bast fibres, and is made up of about 12 layers of cells. The primary bark is composed of about 24 layers, the cells increasing in size as they approach the middle. The cambium layer consists of about three rows of minute cells. The wood contains numerous medullary rays, one or two cells wide, and from five to twenty cells high in axial direction. It furthermore contains wood parenchyma, ducts and prosenchyma. The cells of the first are somewhat thickened, are axially elongated, and found between the groups of medullary rays. The ducts are thinner-walled and larger than the prosenchyma, and have spiral and scalariform markings, while the prosenchyma cells are quadrangular and are marked by dots and disks.

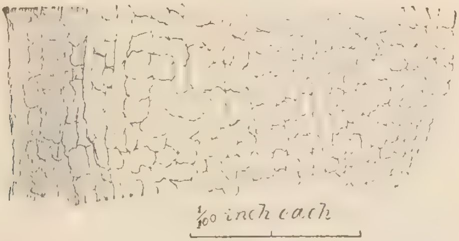
Stem.—The bark is make up of two distinct layers (Figs. 38 and 39) besides the cork. The cork cells are flattened, closely packed and elongated in a tangential direction. The primary bark is composed of large, thin-walled cells, which on cross-section are hexagonal and tangentially elongated. The inner layer of the primary bark has two or three interrupted circles of oil cells, the rest being smaller and hexagonal. The outer layer of the primary bark is composed of hexagonal, tangentially elongated and large cells. The secondary bark is composed of a layer of about twenty bast parenchyma cells and twelve cells of the medullary rays, these latter being larger and the secondary deposits relatively thinner than in the former cells, these being axially elongated. The cambium layer is about three cells in thickness. (Figs. 40 and 41.) The wood consists of medullary rays, wood parenchyma, ducts and prosenchyma. The medullary rays, on a cross-section, are seen to be made up of small radially-elongated cells, the walls of which are materially thickened by secondary deposits, and which are placed in one or two radial

FIG. 38.



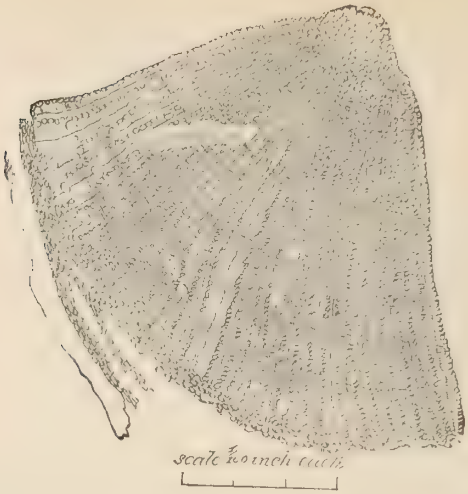
Illicium Floridanum. Stem-bark. Transverse section.

FIG. 39.



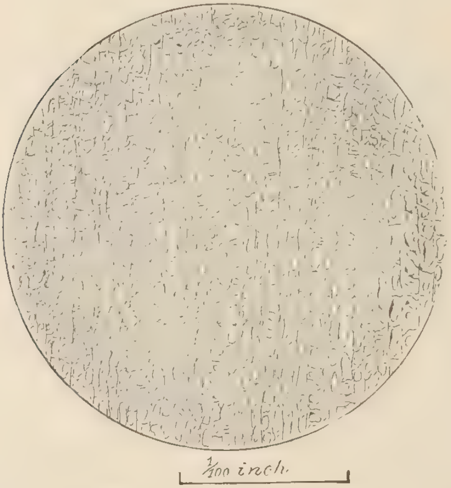
Illicium Floridanum. Stem-bark. Longitudinal section.

FIG. 40.



Illicium Floridanum. Wood. Transverse section.

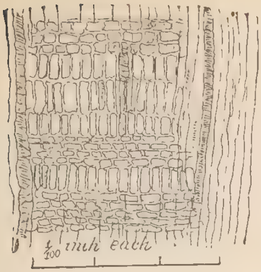
FIG. 41.



Illicium Floridanum. Wood. Transverse section.

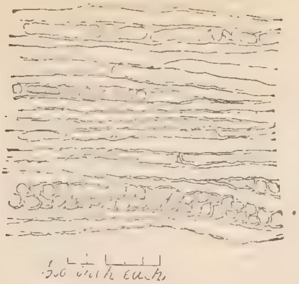
rows, each row containing, in an axial direction, from three to seventeen cells. The wood parenchyma is only found between the perpendicular ends of the medullary rays, consequently in axial lines. (Figs. 42 and 43.) The cells are axially elongated, the cell walls are considerably thickened. The ducts have netted, spiral, and scalariform markings (Fig. 44), while the lateral sides of the parenchyma cells are marked

FIG. 42.



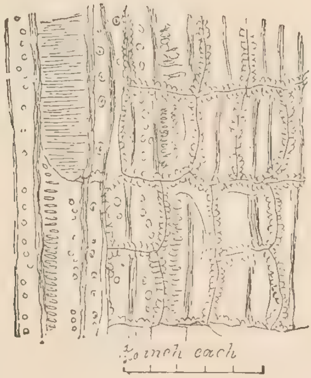
Illicium Floridanum. Wood. Radial section.

FIG. 43.



Illicium Floridanum. Wood. Tangential section.

FIG. 44.

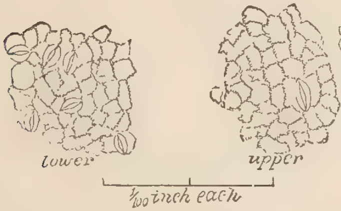


Illicium Floridanum. Wood. Radial section.

with dots and disks. The pith is composed of hexagonal cells, on a cross-section. The cells are smallest near the wood, and gradually enlarge toward the centre.

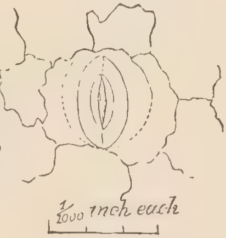
Leaf.—The epidermis is composed of a single layer of flattened, thick-walled, empty cells. The stomata are very numerous on the lower surface (Fig. 45), while only one was found in a space of 3/8 inch square of

FIG. 45.



Illicium Floridanum. Leaf. Epidermis.

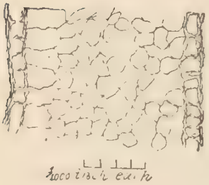
FIG. 46.



Illicium Floridanum. Leaf. Stoma.

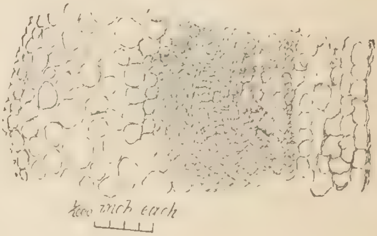
the upper surface. They are made up of four cells, two inner and two outer guard cells (Fig. 46). On a cross-section, the inner guard cells are seen to bulge into the opening at about half the height of the cells. The outer-guard cells are larger, and overlap the inner cells at the edges. The rest of the epidermal cells have wavy cell walls. The portion of the leaf between the epidermal layers is made up of loose parenchyma, with air passages and a single palisade layer occupying (Fig. 47) about one-fourth the thickness of the leaf. The midrib is composed of wood fibres, which, on cross-section, appear quadrangular, with their cell walls slightly thickened (Fig. 48). This prosenchymatous tissue is arranged in radiating lines, and terminates above and below by curves. The concavity, which is toward the upper side of the leaf, is filled by the large-celled spiral ducts, and above this is a single row of bast fibres. On the lower side, the wood is surrounded by a cambium layer, and outside of this there are two or three layers of bast fibres. Surrounding this bundle is the loose parenchyma tissue of the leaf, there being three layers of small cells above, and about six to eight layers below, the cells, as they approach the epidermis, becoming thick-walled. The upper and lower surface of the leaf at this point is covered by a rather thick cuticle.

FIG. 47.



Illicium Floridanum. Leaf. Transverse section with stoma on lower surface.

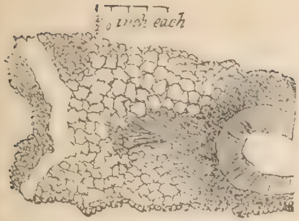
FIG. 48.



Illicium Floridanum. Leaf. Transverse section through midrib.

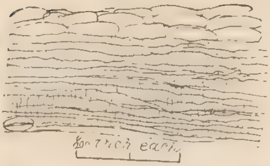
Capsule.—The capsules are composed mainly of parenchymatous tissue, there being only one unbranched fibro-vascular bundle in each carpel running through the fleshy portion at the dorsal suture (Figs. 49 and 50). The receptacle for the seed is lined with closely-packed elongated thick-walled cells having one end directed toward the seed. The cells near the ventral suture are in three layers (Fig. 51), the outer layer being composed of large parenchyma cells which are elongated in the direction of the style. The other two layers contain axially elongated cells with thickened cell walls, those of the middle layer having the smaller deposit. The outer layer is made up of about four rows of cells, and the other two consist of about ten rows together.

FIG. 49.



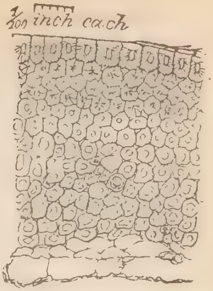
Illicium Floridanum. Capsule. Transverse section through dorsal suture.

FIG. 50.



Illicium Floridanum. Capsule. Longitudinal section.

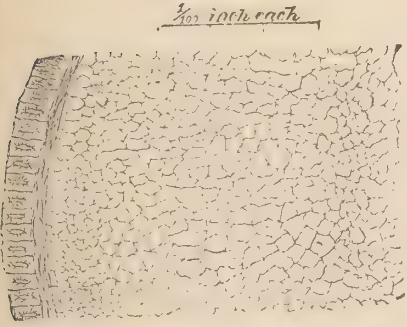
FIG. 51.



Illicium Floridanum. Capsule. Transverse section near ventral suture.

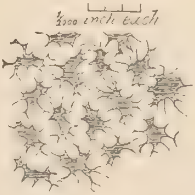
Seed.—The seeds are albuminous. The albumen consists of hexagonal cells, seen in the section (Fig. 52), and contains oil. The endopleura consists of one layer of cells, the walls of which are somewhat thickened. The testa consists of two layers, the inner is composed of about three rows of cells with thickened walls (Figs. 52 and 53), and the outer layer is made up of a single row of cells. The cell walls of the outer layer of the testa are very much thickened and extend in a radial direction. The exterior view of the testa shows the cell walls as wavy lines. The external layer of the testa is yellowish, while the interior one is brown.—Amer. Jour. Phar., May 1885, 225–228.

FIG. 52.



Illicium Floridanum. Seed. Transverse section.

FIG. 53.



Illicium Floridanum. Seed. Exterior view of testa.

Illicium Floridanum, Ellis—*Proximate Examination of the Different Parts of the Plant.*—In continuation of his above paper, Mr. Maisch gives the results of the proximate examination of the different parts of the plant, which are summarized by him as follows:

	Leaves.	Stem.	Root Bark.	Capsules.	Seeds.
Extracted by petroleum	2.600	.190	2.60	1.25	35.80
" " ether	1.460	.230	0.66	1.10	1.30
" " absolute alcohol	5.000	1.900	12.20	9.25	lost
" " water	15.045	1.800	8.90	5.000	1.00
" " diluted alkali	9.900	5.000	10.51	4.00	15.90
" " diluted acid	6.000	1.880	8.00	2.60	3.00
Residue (lignin)	42.600	64.005	42.625	62.300	31.40
Loss	3.645	14.829	.640	3.667	4.60
Moisture	13.750	10.166	13.865	10.833	7.00
Total	100.000	100.000	100.000	100.000	100.00
ASH.					
From airy-dry part	5.033	1.333	5.700	3.500	2.222
From artificially dried	5.835	1.484	6.617	3.925	2.389

Among the special principles isolated may be mentioned a crystalline glucoside from the leaves, which was also contained in small quantities in the capsules. A second crystalline substance, differing from the glucoside, was found in the root-bark, which also contained soluble oil, as did the leaves and capsules. The latter also contained small quantities of the second crystalline principle.—Amer. Jour. Phar., June, 1885, 278–285.

Illicium Religiosum—Proximate Constituents.—Prof. Eykman has continued his investigation of the most important constituents of *Illicium religiosum*, the botanical name of the poisonous star-anise ("shikmi"). He states that the volatile oil of the leaves consists of eugenol and two constituents, which he calls "shikimen" and "shikimol."

"*Shikimen*" is a terpene, probably represented by the formula $C_{10}H_{16}$, boiling at 170° C., having an odor recalling that of lemon oil, and colored orange red by sulphuric acid.

"*Shikimol*" is represented by the formula $C_{10}H_{10}O_2$, boils at 229°–231° C., and is apparently identical with safrol, from *Sassafras officinalis.*

In the fruit the author has found protocatechuic acid, "shikiminic acid," and "shikimipikrin."

Shikiminic acid forms a crystalline powder almost insoluble in ether, insoluble in chloroform, slightly soluble in alcohol, and freely soluble in water. The aqueous solution has an acid reaction, and the metallic salts are freely soluble in water. It is monobasic, melts at 178°–180°, and its composition is probably represented by the formula $C_7H_{10}O_5$.

Shikimipikrin may be represented by the formula $C_7H_{10}O_3$ or $C_{10}H_{14}O_4$. It occurs in large transparent crystals, melting at 200° C., and is freely soluble in water, the solution being neutral to litmus, and having a strongly bitter taste.—Phar. Jour. and Trans., May 30, 1885, 985; Ber. d. D. Ch. Ges. xviii., 281.

MENISPERMACEÆ.

Menispermum Canadense—Separation of a New Alkaloid—Menispine.—Mr. Harry Lee Barber has subjected the rhizome of *Menispermum Canadense* to proximate analysis, and obtained the two alkaloids isolated by Prof. Maisch in 1863, namely, berberine and a white alkaloid which resembles oxyacanthine, from which, as well as menispermine, it differs very materially in its solubilities as well as in its relation to reagents, as is shown in the tables. The behavior of oxyxanthine is that described by Mr. H. B. Parsons. The author prefers the name of *menispine* for the new alkaloid.

	Oxyacanthine.	Menispermine.	Menispine.
Color	White, yellow on expos.	White, yellow on expos.	White, yellow on expos.
Taste	Bitter.	Tasteless, entirely.	Very bitter.
Water	Nearly insoluble.	Insoluble.	1 part in 75.
Alcohol, abs. .	Soluble.	1 part in 200.	Very soluble.
Alcohol, com .	1 part in 30.	1 part in 200.	1 part in 6.
Ether	1 part in 125.	1 part in 60.	1 part in 40.
Chloroform . .	Freely soluble.	1 part in 170.	1 part in 20.
Benzol. . . .	Soluble.	1 part in 200.	Insoluble.
Ammonia. . .	Sparingly soluble.	Insoluble.	Insoluble.
Sal. Soda. . .	Moderately soluble.	Insoluble.	Insoluble.
Sol. Soda Carb.	Nearly insoluble.	Insoluble.	Insoluble.

It will be noticed that the alkaloid resembles oxyacanthine in color and influence of air. The bitter taste was distinctly noticeable in a solution of one part in fifteen hundred; it is to be remarked in this connection that it was not nauseous, but agreeable, like that of gentian.

A marked difference in the solubilities is seen, the alkaloid being five times more soluble in alcohol than oxyacanthine, and over three times in ether. While oxyacanthine is more or less soluble in ammonia, solution of soda, and solution of carbonate of sodium, the alkaloid in question is entirely insoluble in all three.

It was also noticed that menispermine was entirely insoluble in and unchanged by hydrochloric acid, but menispine is freely soluble without residue. Other marked differences are that menispermine is perfectly devoid of taste, the other persistently bitter, even in very dilute solutions. Menispermine is insoluble in water, and barely soluble in excess of alcohol and chloroform.

The following experiments prove, in the opinion of the writer, the alkaloid to be distinct from either oxyacanthine or menispermine. The solutions used in this case were in alcohol, 94 per cent., the strengths being one part in two hundred. The reactions of the white alkaloid of *Menispermum Canadense* are identical in both water and alcohol; the table given by the author describing the precipitates obtained from the weaker solutions as being of a paler color, but as being distinctly observable in a $\frac{1}{1000}$ solution, the reactions with potassio-mercuric iodide, phospho-molybdic acid and tannin being faintest. Menispermine was examined at the suggestion of Prof. Maisch, to whom the author is indebted for the sample used in the experiments.

	Menispermine.	Oxyacanthine.	Menispine.
Tr. Iodine.	Yellow ppt.	Dark brown red ppt.	Dark red ppt.
Iodine in KI.	“ “	“ “ “	“
Potass. Merc. Iod.	White “	Yellowish ppt.	Yellowish white ppt.
Ac. phospho-molyb.	“ “	Brown ppt. insol. in, but dark blue by NH_4OH.	Yellow ppt. sol. in NH_4OH without change.
Potass. cadm. Iod.	“ “	White ppt.	Grayish ppt.
Acid, picric.	Yellow “	Insol. in $HC_2H_3O_2$. Yellowish ppt.	Sol. in $HC_2H_3O_2$. Yellow ppt.
Platinic chloride.	“ “	Insol. in HCl. Yellowish ppt.	Insol. in HCl. Yellow ppt.
Gold chloride.	“ “	Insol. in HCl. Orange ppt.	Insol. in HCl. Orange ppt.
Acid, tannic.	“ “	Brownish ppt. insol. in $HC_2H_3O_2$, and dil. HCl.	Whitish ppt., insol. in $HC_2H_3O_2$ and dil. HCl.
Acid, sulph. conc.	Yellow coloration.	Brownish purple, darker on standing.	Brown, fades on standing.
Acid, sulpho-molybdic.	Yellowish “	Purple, fades slowly, becomes yellow, then green.	Brown, fades to yellow.
Acid, nitric, conc.	No change.	Orange red, effervesces, color permanent.	Effervesces, yellow, permanent.
Zinc chloride, fused.	“	Chocolate brown.	Brownish yellow.

The four last mentioned reagents were applied to the powdered alkaloids.—Amer. Jour. Phar., Aug. 1884, 401–404.

BERBERIDACEÆ.

Jeffersonia Diphylla—Absence of Berberine in the Root.—The root of this plant, called "twin leaf," "ground squirrel pea," and "rheumatism root," has the repute of containing berberine as a constituent. Mr. Anson W. Flexor has carried on numerous experiments, which are given in detail, in the laboratory of Prof. J. U. Lloyd, which very conclusively prove the absence of this alkaloid. The experiment was made with authentic specimens of the root.—Amer. Drug., Dec. 1884, 227.

RUTACEÆ.

Angustura Bark—Characters of Alkaloidal Constituents. — Messrs. Koerner and C. Böhringer give preliminary notice of three alkaloids which they have isolated from angustura bark, two of which they have subjected to closer examination. These alkaloids are mostly in the free state, and may be extracted directly from the bark by means of ether. After the ethereal extract has been washed with dilute potash solution, the addition of oxalic acid or dilute sulphuric acid gives a yellow crystalline precipitate of the corresponding salt of one of the alkaloids, *cusparine*, while other alkaloidal salts remain in solution.

The precipitated cusparine salt is moderately soluble in boiling alcohol, and, on cooling, crystallizes out in slender needles of a magnificent greenish yellow; this color is not removed by repeated crystallization, or by treatment with animal charcoal, and other salts of the alkaloid, obtained from the yellow precipitate by decomposition, are also intensely yellow. If, however, the free cusparine, $C_{19}H_{17}NO_3$, obtained from these colored salts, is crystallized several times from light petroleum, and then reconverted into the salt, this is found to be colorless. The author has been unable to ascertain the cause of this yellow coloration. The alkaloid crystallizes from light petroleum in tufts of slender needles melting at 92°; it is moderately soluble in ether, more readily in alcohol. The sulphate, oxalate and hydrochloride of the base are but sparingly soluble in water; the acetate is much more soluble, but the solution is decomposed if largely diluted; the tartrate dissolves readily. The platinochloride was obtained as an orange-yellow crystalline precipitate.

When treated with potassium hydroxide, cusparine splits up, yielding a new alkaloid, and the potassium salt of an acid which seems to be an aromatic derivative; the acid is sparingly soluble, and crystallizes readily. The alkaloid crystallizes from alcohol, in which it is very sparingly soluble, in minute, very brilliant, colorless needles; it decomposes at 250° without melting. An attempt to decompose the cusparine in a similar manner by the action of hydrochloric acid failed, as it began to carbonize even at 100°.

In the mother-liquors from which the cusparine was originally precipitated as sulphate or oxalate, another alkaloid is found, to which the authors have given the name *galipeïne*, $C_{20}H_{21}NO_3$. The free base crystallizes from light petroleum in white needles, melting at 115.5° It may be obtained in well-formed transparent prisms from its solution in ether or alcohol. All the salts of this alkaloid are more soluble than those of cusparine; several of them are of a magnificent greenish yellow like uranium salts. The sulphate crystallizes in large prisms with 7 mols. H_2O, which it loses in part on exposure to the air; it melts at 15°, and at 100° undergoes decomposition, yielding the sulphate of another alkaloid and a crystalline nitrogenous substance which melts at 196°. The platinochloride crystallizes in prisms with a triangular base.

Besides cusparine and galipeïne, the authors have found another alkaloid which melts at 180°, and is very sparingly soluble in ether. It crystallizes from alcohol and furnishes salts, the solutions of which have a blue fluorescence—Amer. Jour. Phar., July 1884, 375–376; from Jour. Chem. Soc. and Gazzetta Chim. Ital., vol. 13.

Guiacum Resin—Examination.—J. S. Ward examined three samples of this resin, and reported his results to the Liverpool Chemists' Association, at the meeting held November 6th last. Petroleum spirit had no solvent action. Alcohol dissolved 96.22, 92.96 and 87.28 per cent.; ether took up 88.89, 89.91 and 84.12 per cent., and water between 3.00 and 4.66 per cent. The alcoholic and ethereal extracts were found to be soluble in glacial acetic acid, and in liquor potassæ, but only partly soluble in chloroform and in ammonia. Two samples of the resin yielded .299 and .334 per cent. of ash, consisting almost wholly of calcium salts, while the third sample, which had yielded least to alcohol and ether, and most to water, gave 6.55 per cent. of ash.—Amer. Jour. Phar., May 1885, 247; Phar. Jour. and Trans., Nov. 22d, p. 413.

Evodia Longifolia—Use as a Preventive of Miscarriage.—The leaves of *Evodia longifolia*, a native of Fiji, have recently been sent to England by a surgeon resident there, who states that they are used by the native women as a preventive of miscarriage. In two cases which came under his notice the remedy proved successful. In one case there had been seven and in the other two miscarriages previous to the use of the drug. The infusion is used for several months previous to confinement, and is made in a most effectual manner by rubbing the leaves into a pulp with cocoanut milk, adding more liquid and straining, the resulting greenish mixture forming the medicine. The plant is known in Fiji as "Ucisalusalu."—Phar. Jour. and Trans., May 2, 1885, 890.

Bois Piquant—Proximate Analysis of the Bark.—Messrs. E. Heckel and F. Schlagdenhauffen have examined the bark of "Bois Piquant" from Guiana, and find it to agree exactly with Guibourt's description of

Xanthoxylum Caribæum.—It resembles angustura bark in external appearance, but its anatomical structure is entirely different. When extracted with light petroleum, the bark yields a considerable quantity of chlorophyll, fat, and wax, together with a crystalline substance which can also be extracted by alcohol. This substance forms colorless needles of the composition $C_{12}H_{24}O$, which melts at 285°, and gives no coloration with nitric, sulphuric, or hydrochloric acid.

If the alcoholic extract, after separation of these crystals, is diluted with water, mixed with lime, evaporated to dryness, and the residue extracted with boiling alcohol, a second crystalline substance is obtained which resembles the vegetable alkaloids in its general properties. It exists in the bark only in very small quantities. With nitric acid, it gives a deep-red coloration, but if the liquid is evaporated on a water-bath and mixed with stannous chloride, no violet color is produced. Sulphuric and hydrochloric acid have no action on it, but sulphuric acid and potassium dichromate, manganese dioxide, or lead dioxide, produce a violet coloration similar to that produced by strychnine mixed with a little selenium. An alcoholic solution of bromine also produces a deep blue coloration which persists for a long time. Five mgrms. of this alkaloid injected in aqueous solution beneath the skin of a frog, produce rapid general paralysis, followed by death in about half an hour, and similar effects are observed with rabbits and guinea-pigs.

A nitrogenous resinous substance, soluble in water, was also obtained from the bark. It has the general properties of the alkaloids, and in its physiological action very closely resembles the crystalline alkaloid just described, although it differs from it in physical properties. None of the so-called xanthopicrite could be obtained from the bark.—Amer. Jour. Phar., Jan. 1884, 579; from Compt. Rend., 98, 996–998.

LINACEÆ.

Linseed—Proper Character of the Meal.—In a former paper (1871) Mr. Thomas Greenish drew attention to the linseed meal made in accordance with the directions of the British Pharmacopœia, *i. e.*, the cake of linseed from which the oil has been pressed, reduced to powder, as being unsuitable for the purpose for which linseed meal was ordered, and strongly urged on pharmacists to keep crushed linseed, as being more suitable for the cataplasms of the Pharmacopœia; but at that time his information as to the mode of preparation of the crushed linseed was insufficient, and he now suggests it for the use of pharmacists, to the exclusion of the preparation made acccording to the directions of the Pharmacopœia. The kind is known in commerce as the "best light crushed linseed." The linseed from Bombay being the richest in farina, and being also the most free from weed seed, and consequently from the cruciferous seed, is recommended for the production of the crushed linseed, and this, with the removal of 20 per cent. of the husk, but retaining the whole of the oil, is recommended as the best for pharmaceutical purposes, and the one which he hopes will hold a place in the next Pharmacopœia to the exclusion of that now directed to be used. The author recommends about 20 per cent. of the husk being removed from the crushed linseed, as it then makes a more elegant preparation; but as the husk yields that mucilage which give a plastic character to the poultice, it is not desirable that the whole should be removed.—Yearbook of Pharmacy, 1884, 467–473.

STERCULIACEÆ.

Kola Nuts—Constituents.—Mr. Dujardin-Beaumetz remarked at a recent meeting of the Paris Société de Thérapeutique, that analysis has shown the fruit of *Sterculia acuminata* to contain a large amount of caffeine, tannic acid, and a little theobromine. Naval surgeons had employed it with success in the chronic diarrhœas of hot climates, and its use was likewise indicated in cardiac affections and in the cachexiæ. He himself had seen good effects from it in these cases, given either in the form of an infusion of the roasted nut, as an elixir, or in the shape of chocolate. In all these cases it acted as a tonic and astringent.—Amer. Jour. Phar., Dec. 1884, 644; from Med. Bulletin, October 1884.

Theobroma Cacao.—Percentage of fat in *chocolate*, which see under "Confectiones."

TERNSTRŒMIACEÆ.

Tea—Analyses of Commercial Sorts.—Mr. Joseph E. Geisler reports the results of the analyses of a large number of commercial teas as found in the New York markets. The sorts examined cover only such as might properly be used, and the examination did, therefore, not include the worthless stuff sold under the name of tea. The results are given in three tables. The first of these shows the percentages of extractive by infusion, the total extractive, tannin, theïn, ash, etc., in the individual examples; the second, the average percentages in Indian, Oolong and Congou teas; and the third table the percentages contained in infusions obtained under the conditions that ordinarily prevail when tea is prepared for the table (infusion in boiling water for ten minutes). They show that the cheaper sorts generally contain less theïn and soluble ash-constituents than the more valuable varieties. The latter amounts in good sorts to about 3%. The amount of extractive also corresponds to the quality of the tea, and the better qualities also yield their valuable constituents more completely and abundantly to the boiling water under the ordinary conditions of preparing the tea as a beverage. The percentage of tannic acid varies greatly, but 10% may be taken as the minimum. Green teas, and some of the Oolongs, contain more tannic acid, as well as extractive, than the Congou teas. The more ready extractibility of the better qualities of tea may be referred to the fact that these are the product of the younger and more succulent leaves. The inferior percentage of tannin in the Congou teas is probably due to its partial decomposition during the protracted period of fermentation to which they are subjected. The author briefly gives the methods of analysis employed.—Phar. Rundschau, Dec. 1884, 263–265.

Tea—Percentage of Caffeine in Several Samples.—See *Fluid Extract of Camellia* under "Pharmacy," and *Caffeine* under "Organic Chemistry."

GUTTIFERÆ.

Symphonia Fasciculata, Dup. Th.—*Description, etc.*—Prof. H. Baillon, who promises a chemical analysis of the seeds, describes *Symphonia fasciculata* as a handsome Madagascar tree, all portions of which are filled with a milk-sap. It is named by the natives

Hazeen, or "little *vongo*," and its fruit, according to Poivre, is called *voa-su-vuara*. The branches, leaves, and fruit, when incised, exude the milk-sap in form of a viscid, bright-yellow juice, which soon turns to resin on exposure to air. This is, of course, inflammable; it is used to make torches of, and for caulking ships.

The fruits are ovoid-acute, about 1½ decimeter (6 inch.) long, and 1 dm. (4 inch.) thick, and have a thick, coriaceous and slightly rugged skin. Each contains from 60 to 100 obovoid seeds, about 2 cm. (¾ inch) long, pale-gray, and marked with a handsome net-work of vascular vessels on the surface. It contains a single obovoid embryo containing a large quantity of fatty matter.

This fatty matter is eatable, but the natives employ it also for burning in lamps and for a great variety of domestic and *medical* uses. Among its special uses is that in form of salve, prepared by mixing the fat with the resin exuded by the tree, as a remedy in skin diseases (such as leprosy, itch, and ulcers) and as an embrocation in rheumatism and contusions.—Amer. Drug., Aug. 1884, 143; from Jour. de Phar. et de Chim.

VITACEÆ.

Grecian Wines—Quality, etc.—Prof. H. Landerer draws attention to Grecian wines, which, he says, deserve the general title of "excellent," being—aside from the bouquet and taste—perfectly pure, because made from pure grape juice, and moreover rich in phosphates, while the red wines, in addition, are rich in tannin and extractive matter. They are superior to all others for preparing medicinal wines; and the red wines, especially, are highly prized as superior tonics in chronic diseases, debility, and wherever a generous wine is indicated. Those who desire to obtain the very best wines may find them upon the island of Santorin, or of Ica, or in Eubœa. The sweet wines of Santorin are "ladies' wines," and surpass all similar products of Sicily or Spain. The strongest Greek wines contain up to 16 per cent. of alcohol, such being particularly adapted for improving the quality of lighter wines.—Amer. Drug., Nov. 1884, 203.

Red Wines—Detection of *Aniline-Red*, which see under "Organic Chemistry."

Wine—Determination of Tartaric Acid, and of *Sugar*, which see under "Organic Chemistry."

Wine—Detection of Copper and Lead.—Hager recommends mixing the suspected wine with ¼ or ½ volume of clear liquor sodæ, when the mixture should remain clear even if boiled; a colored turbidity would indicate the probable presence of copper. Put 6 cc. of the clear mixture in a test-tube and introduce a piece of tin-foil, which should be entirely covered by the liquid; warm in a water-bath for about ½ or 1 hour. If the wine be free from lead and copper, the tin foil will remain glossy; slight traces of these metals cause the tin foil to lose its lustre, and to become grayish; in the presence of more than traces of these metals the tin foil will become dark gray to dark grayish black (lead); dark steel colored, brown or brownish black (copper). Boiling will accelerate the action. Presence of zinc or arsenic will not interfere with the above reaction.—Amer. Jour. Phar., April 1885, 173; Ph. Centralhalle, No. 8, 1885.

ERYTHROXYLACEÆ.

Erythroxylon Coca.—Dr. F. Hoffman contributes a paper on coca, giving a description of the plant, its history and uses, for which see Pharm. Rundschau, Dec. 1884, 260–263.

Coca—Commercial Condition.—Dr. E. R. Squibb, speaking for the first six months of the year 1884, has found the principal markets of the world for this drug to have been exceptionally bad. Good coca was sought for in the ports of Central and South America, in London, Hamburg and New York, without limitation in price, but was almost invariably unobtainable, though an abundant supply of coca of poor quality, and quite unfit for use, was to be had. In fact, but one or two small lots of modererately good coca were secured by him during the year past. Following the process of Dragendorff, slightly modified, for the estimation of alkaloids, he found the best qualities of the present supply to yield only .25 per cent. of cocaine, a quantity which corresponds with that obtained a number of years ago by Dr. Niemann and by Prof. John M. Maisch. These latter, however, employed processes which the author considers imperfect, as compared with that of Dragendorff, and his results therefore point out an inferiority.—Ephemeris, July 1884, 599–605.

Coca—Quality.—In "Ephemeris" (May 1885, 788–795), Dr. Squibb communicates some highly interesting information on the sources of supply of coca. He finds the present supply to be much more satisfactory than that recorded above, and believes that future importations, owing to greater care in packing and selection of containers (tin vessels) will show still greater improvement. A number of samples recently assayed by the author gave no less than .35 per cent. of cocaine, and some lots as much as .4 per cent.

Erythroxylon Coca, Lam.—*Isolation, Characters and Therapeutic Value of the Alkaloid* (Cocaine) and its salts. See *Cocaine* under "Organic Chemistry."

SAPINDACEÆ.

Guarana—Percentage of Caffeine, etc.—Dr. E. R. Squibb has determined the alkaloid in a sample of selected guarana, and describes the process pursued in the determination. He obtained 4.38 per cent. from the drug direct, and from some fluid extract prepared from the same lot of guarana 4.3 per cent. It is generally stated by authorities that guarana yields 5 per cent. of caffeine, but the author is of opinion that the best parcels of commerce, if taken in their entirety, will not yield more than 4 per cent. Guarana being at best a rude heterogeneous mixture, neither the ingredients nor their preparations being known with any degree of certainty, the author expresses surprise that it should have been so largely accepted into the materia medica. He suggests as a substitute for guarana green coffee, and recommends a fluid extract prepared like that of tea (see under "Extracta Fluida"). Ephemeris, July 1884, 612–616.

PAPAVERACEÆ.

Opium—Observations as to Cultivation, etc.—A posthumous paper on opium, by the late Mr. Aubergier, which has just been made public in part, contains the results of observations continued over many years. Mr. Aubergier's earlier investigations led him to the conclusion that the poppies with white seeds yielded an opium containing less morphine than the different varieties of poppies with black seeds; also that the opium from white-seeded poppies contained a large proportion of narcotine, whilst opium from black-seeded poppies contained very little, and sometimes none at all. This opinion was confirmed by examination of the exhibits from Smyrna and Egypt in the Exhibition in London, in 1851. An examination in 1867, of a sample of Persian opium, which was rich in morphine and narcotine, showed, however, that his conclusion was subject to some modifications. Having obtained some capsules from Persia, he found them to constitute a new variety of white-seeded capsules, differing in form and dimensions from any white-seeded variety he had previously known, but approximating in these respects, as well as in the richness in morphine of the opium yielded, to the black-seeded varieties. The plant, when cultivated in France, yielded an opium richer than that received from Persia, a result which Mr. Aubergier was inclined to attribute to the choice of a proper time for collecting. He points out that the primary function of the plant is not the production of opium, but rather that the milky juice is intended to assist in the maturation of the fruit, and that, within certain limits, the nitrogenous principles in the pericarp may be expected to disappear in proportion as the seed is developed. It was observed that in one case where the collection, from want of laborers, was made a little late, the opium contained only 11 per cent. of morphine, whilst a neighboring grower, who made his collection at an earlier stage, obtained an opium containing 18 per cent. Notwithstanding very favorable results, so far as alkaloid was concerned, the attempt made by Mr. Aubergier to introduce the opium poppy cultivation in France, appears to have been hampered by the labor difficulty.—Phar. Jour. and Trans., Feb. 28, 1885, 693; L'Union Pharm., Feb. 1885, 62.

Persian Opium—Causes of Decline in Production, etc.—Mr. Benjamin, British Consul-General at Teherân, observes that some years ago the production of opium in Persia was larger than at present. The unusual proportion of morphia which Persian opium contains, made it justly preferable to that produced elsewhere, and large quantities found their way to foreign markets, and especially to China.

Two causes have latterly tended to check the culture and export of Persian opium, although the trade in the article is still important. One of these causes alone might not have led to such a result, but two coming about the same time have somewhat discouraged the production of Persian opium. These causes were, the increasing adulteration of the article, and the fact that the attention given to its culture materially reduced the more important culture of wheat, which led the government to regard the opium product with disfavor.

Persian opium is chiefly grown in the provinces of Kermanshâh and Ispahân. The latter city is the centre of the opium trade of Persia. The opium of Ispahân is the best; the highest grade has been found to contain 15 to 16 per cent of morphia. It is fair to state, however, that of late the opiums of Kûm, Teherân, and Yezd have been growing in favor, some specialists considering the quality raised at Kûm as surpassing every other grade of opium. As the highest quality of Smyrna opium does not contain a mean of over 13.57 per cent. of morphia, some analyses placing it even lower, while the Persian drug yields at its best 13 to 16 per cent. of morphia, hard, it certainly rivals that of Smyrna, and is beyond question far superior to that of Egypt and India.

The chief objection to the opium of Persia lies in the adulteration to which it is subjected, the chief ingredient in this deterioration being grape-must, and sometimes small stones concealed in the parcels. This difficulty could be remedied by any enterprising house which, through honest, capable agents, could purchase the entire product of Persia, or of any one of the opium-producing districts, and give direct attention to the preparation and packing of the drug. A pure article could also be obtained by a firm ready to form a contract for a certain quantity of a given grade of the drug for a term of years, the continuance of the contract depending on the non-varying proportion of morphia in the exported article.—Amer. Jour. Phar., Jan. 1885, 36–37, from Pharm. Jour. and Trans., Nov. 1884, 430.

Opium—Isolation of a New Principle—Opionin.—Which see under "Organic Chemistry."

CAPPARIDACEÆ.

Capparis Coriacea—Use for the Cure of Epilepsy.—Dr. Larrea y Quezada describes his own cure from epilepsy when a boy of thirteen by the administration of the fruit of *Capparis coriacea.* He had suffered fourteen attacks, preceded by a distinct aura, and took 45 grams of the powdered fruit night and morning in wine; the cure is stated to have been immediate and complete. He states that he has used the drug with success in nervous and hysterical cases, as well as epilepsy.—Phar. Jour. and Trans., May 2, 1885, 890; Lancet, April 18, 1885, 722: from Boletin Medico (Peru).

BIXACEÆ.

Bixaceæ—Examination of the Seeds of Different Species.—Dr. Jos. Moeller has examined the seeds of three species of Bixaceæ, with the following results:

Gynocardia odorata, R. Brown.—The seeds are about 3 cm. long and 1.5 cm. in their greatest breadth, elongated ovate, somewhat flattened, and irregularly angular; the hilum is at the pointed end. The surface is dull yellowish gray, and somewhat scurfy to the touch from an adhering thin layer of pulp. The seeds weigh about 3 gm., of which the integument is 0.8 gm. The latter consists of an outer and inner layer of stone cells placed parallel to the surface, and, between these, two layers of two or three rows of stone cells, the long axes of which are nearly at right angles with the former cells. The inner surface of the sclerenchymatous tissue is covered with a delicate and partially-broken layer of elongated parenchyma cells. The endosperm consists of tolerably thick-walled cells filled with solid colorless fat and large yellow spherical or irregularly rounded bodies, insoluble in alcohol and benzol; starch and tannin are absent; calcium oxalate crystals were not observed.

Hydnocarpus Anthelmintica, Pierre.—The seeds are about 18.14 mm. broad, little longer, resemble a small bulb in shape, weigh barely 2 gm. (the albumen 0.6 gm.), are brownish black, rough, hard, and have a large rayed hilum. The integument is 1.5 mm. thick, and has a lighter colored inner layer 0.15 mm. thick, and consisting of tangentially arranged, and relatively little thickened, stone cells; the cells of the middle layer are placed at right angles to the surface; those of the exterior layer are tangentially arranged, and those of the adhering pulp are rather small and frequently interspersed with groups of stone cells. The cells of the endosperm are smaller than in Gynocardia, and do not contain the yellow bodies seen in the latter, but besides oil containg numerous colorless roundish albuminöid granules. (See next page.)

Hydnocarpus Inebrians, Vahl.—Some of the seeds resemble the preceding, but are flatter, whilst others are pointedly elliptical in shape. They attain a length of 3 cm., a breadth of 15 mm., and a thickness of 10 or 12 mm. The hilum is prominent and warty, the surface longitudinally wrinkled. The weight of the smaller seeds is about 1 Gm. (the integument one-third), of the larger seeds, about 2 gm. The integument is 0.2 mm. thick, and consists of three layers of stone cells, arranged as in the two preceding seeds, but the middle layer has only one, or at most two, rows of cells. The adhering pulp resembles that of *H. anthelmintica*. The endosperm is covered with a layer of thin-walled brownish red cells, but is itself colorless, and teems with fat and protein globules.—Amer. Jour. Phar., Mar. 1885, 145–146; from Phar. Jour. and Trans., October 25, 1884, p. 321.

Lukrabo, or Ta-fung tsze—Botanical Source.—In the interesting papers on "Chinese Materia Medica," by the late Daniel Hanbury, published in the "Pharmaceutical Journal" ([2] vol. iii., 1862), a seed is described and illustrated under the name of *Ta-fung-tsze*, which he conjectured to be allied to *Chaulmugra*. This seed is largely used in China in skin diseases and leprosy, and appears to have been employed in that country for at least three hundred years, since the tree affording the seed is figured in the old Chinese herbal, "Puntsaou," published A. D. 1596. The tree, however, has up to the present time been unknown to botanists.

The *Ta-fung-tzse* is still an article of considerable commerce, figuring in the Consular Blue Books under Chinese imports by the name of *Lukrabo*. The seed in question is about half the length of *Chaulmugra* seed, but of equal diameter. The shell is thicker and harder, and at one end is marked with a few radiating slightly-raised ridges, whereas that of *Chaulmugra* is quite smooth.

In the Kew Report (1878, p. 33) the seeds, under the name of *Dai-phong-tu*, are said to be used in Saigon as a vermifuge after the extraction of the oil. It is added that Mr. Pierre has successfully raised some seeds of the plant, and refers it to the genus *Hydnocarpus*.

Mr. E. M. Holmes has addressed Mr. Pierre, who has forwarded for the herbarium of the Pharmaceutical Society a specimen of the plant with flowers and seeds. He states that it is a new species, which he has named

Hydnocarpus Anthelmintica, Pierre.—It is very nearly allied to *H. alpina*, Wight, p. 940, but its leaves are more linear-oblong. The scales opposite to the petals are less long and more ciliated; the stigma is furrowed in its whole extent, and is only toothed towards the extremity of its reflexed margin, while in *H. alpina* it is furnished with large lobes. The male flower contains a rudimentary ovary; in the female flower this is pyramidal. The seeds are used as a vermifuge by the Annamites. The names given in Annam to the plant are *Dai-phong-tu* and *Thaoc-phu-tu*. The specimen sent was gathered in the province of Bien Hoa, in Southern Cochin China. A figure of the tree will, probably, be given in the magnificent "Forest Flora of Cochin China," now being published by M. L. Pierre under the auspices of the French Government.

The botanical source of this important eastern drug is thus at last satisfactorily cleared up.—Amer. Jour. Pharm., Oct. 1884, 525–526, from Phar. Jour. and Trans., July 16, 1884, 41.

Annatto—Extraction of Constituents.—The two principal constituents of annatto are *orantin* and *carotin*, the former of which is obtained by digesting 50 gm. of annatto with 100 gm. of sodium carbonate in 1 liter of water, and evaporating to one-half, while carotin is prepared by digesting annatto in oil.—Bied. Centr., 1884, p. 215. Carotin was discovered by Wackenroder (1832) in the root of *Daucus carota*, Linné.—Amer. Jour. Phar., Feb. 1885, 109.

DROSERACEÆ.

Drosera rotundifolia—Assimilation and Necessity of Animal Food during Development.—H. Büsgen has made comparative experiments intended to answer the question whether the capture of insects by these and similar plants assists their development. The experiments were made with seedlings grown in peat, which were previously boiled in a nutritive solution; these were placed on saucers and covered with bell glasses; one set were fed with the lice from vine leaves, the other received no such nourishment. The unfed plants were less strong and healthy, 16 plants producing 9 flower branches and 20 capsules, while 14 of the fed plants produced 17 flower branches and 90 capsules; the total dry weight of the fed plants was 0.352, and of the unfed plants 0.119 grams. Other trials under less favorable conditions gave similar results, and the author considers it as proved that the plants of drosera are capable of utilizing animal food and assimilating it beneficially for the production of seeds.—Jour. Chem. Soc., 1884, p. 917; Bied. Centr., 1884, p. 47; Amer. Jour. Phar., Feb. 1885, 106.

CARYOPHYLLACEÆ.

Herniaria Glabra, L.—*Medicinal Use.*—This plant is recommended by Zeissl in catarrh of the bladder; it is given in the form of infusion, 1 gram being used with the same quantity of *Chenopodium ambrosioides*, Linné, to 1 liter of boiling water. The addition of milk renders the infusion more agreeable.—Allg. Med. Ztg.

Herniaria grows in sandy fields throughout the greater portion of Europe and Northern Asia. It is inodorous, has a saline, somewhat astringent and slightly bitter taste, and was formerly employed in dropsy, in diseases of the bladder and kidneys, and in hernia: it has long since fallen into disuse.—Amer. Jour. Pharm., May 1885, 247.

HAMAMELIDACEÆ.

Hamamelis Virginica—Physiological and Chemical Properties.—Dr. H. Guy has published a lengthy paper, in which the physiological, chemical and therapeutic properties of witch-hazel are fully considered. The chemical investigation revealed no alkaloidal substance, and any activity of the drug or its preparations must be attributed solely to an essential oil. Therapeutically it is uncertain in its action, though it appears to possess some value as a hæmostatic and in hæmorrhoids. It was found not to have toxic properties, large doses being borne by inferior animals without poisonous symptoms. It does not appear to have any special action on the heart, veins or arteries, and in the opinion of the author, which is formed by physiological and therapeutic experiments of Dr. Dujardin-Beaumetz and other Parisian physicians, it is a very much overated medicine.—Brit. Med. and Surg. Jour, April 16, 1885, 361.

CRASSULACEÆ.

Sedum Acre, Lin.—*Uses in Medicine*—This plant is recommended by Dr. Louis Duval, of Madrid, as a remedy for diphtheria, a decoction in beer being made of which a wineglassful is taken every hour. After several doses copious vomiting is produced, removing the diphtheritic membranes.

This is the *mossy stonecrop* of our gardens, and naturalized in dry and rocky places in the United States. It formerly enjoyed considerable reputation as a remedy in scurvy, dropsy, epilepsy, and externally in ulcers and various skin diseases.—Amer. Jour. Phar., June 1885, 301.

COMBRETACEÆ.

Terminalia Chebula, Retzius—*Uses.*—The dried immature fruits furnish the Turkish drug "kara kalileh," the black myrobalans of old writers. They are shriveled, black, hard, ⅓ to ¾ inch long, with a shining fracture and very astringent taste. Mr. Dickson states that the drug is a mild tonic laxative, in great repute among the Mecca pilgrims, probably because the hadjis tell them that the Prophet praised its virtues. It should be broken up into a coarse powder and swallowed, has a ligneous, bitterish flavor; and, in the dose of a drachm, acts as a very mild laxative. The Indian Pharmacopœia mentions the drug as combining mild purgative with carminative and tonic properties.—Amer. Jour. Phar., May 1885, 248; Phar. Jour. and Trans., Dec. 20, 1884, p. 483.

Terminalia Chebula—Isolation of a New Organic Acid from the Fruit.—Mr. Fridolin reports the isolation from chebulic myrobalans of a new organic acid, which he has named *chebulinic acid*, and which he considers to be probably the source of the gallic and tannic acids that have been previously described as occurring in the fruit. He obtains it by saturating an aqueous solution of an alcoholic extract of the fruit with chloride of sodium, dissolving the matter that separates in water, and shaking the solution with acetic ether, which takes up the chebulinic acid together with tannic acid. The ethereal solution being evaporated, the residue is dissolved in a little water and allowed to stand several days, when the chebulinic acid crystallizes out in rhombic prisms. Chebulinic acid is odorless and has a sweet taste, dissolves very readily in alcohol and hot water, not so readily in ether, and with great difficulty in cold water, the solution having an acid reaction. In aqueous solutions, chebulinic acid reduces Fehling's solution, and in some of its reactions it closely resembles gallic acid. The author suggests as a formula probably representing its composition, $C_{28}H_{24}O_{19}$. When heated in a close tube with water, it takes up the elements of the latter, and the molecule is split into two molecules of gallic acid and one molecule of tannic acid. Phar. Jour. and Trans., Aug. 2, 1884, 82.

MYRTACEÆ.

Eucalyptus Globulus—Inefficiency in Swampy and Marshy Districts.—In a recent report of the Lucknow Horticultural Gardens, Dr. Bonavia expresses a wonder that this tree should have been thought suitable and of value for rendering swampy and marshy districts healthful. He says that in the plains of India as soon as the *Eucalyptus globulus* feels the rains it dies off, and appears not to be in the least capable of withstanding moisture and heat combined. This appears to agree with the results of experiments made in this direction in Italy. The author says that in the Nilgiris, where there is both moisture and drainage, and where the temperature is not high, the tree thrives wonderfully. In the Lucknow district much better results have been obtained with the

Eucalyptus Citriodora, the trees flowering and seeding, and the seeds germinating, whilst the trees do not appear to be affected by heat, cold, dryness or moisture.—Phar. Jour. and Trans., June 27, 1885, 1069; Gard. Chron. June 13, 1885, 762.

Pomegranate Bark—Proximate Constituents.—According to Carl Julius Bender, pomegranate bark contains one crystallizable and two amorphous bases. He discards the name Pelletierine, and proposes to name the crystalline base "Punicine." A process is given for the preparation of a stable crystallized sulphate.—Amer. Jour. Phar., April 1885, 172; Pharm. Centralh., 1885, 6.

Sizygium Jambolanum—Use of the Fruit in Diabetes.—Mr. Banatrala reports on the use of the fruit of this East Indian plant, which has recently been in demand for use in the treatment of diabetes. The author has found, in three cases in which he has tried it, that its use led to a diminution in the amount of urine secreted, and that it caused the disappearance of the sugar. These results were manifested in forty-eight hours after taking the medicine. During the time that the patients were submitted to the action of the drug they could take amylaceous food with impunity. The astringent rind of the fruit appears to be the active part. Amer. Jour. Phar., Sept. 1884, 476; from Rép. de Pharm.

Calicanthus Lævigatus, Willd.—*Uses of the Bark.*—Dr. E. W. Lane reports this plant, known as "sweet-scented shrub," under the name of "Southern Peruvian." The bark is employed medicinally in the south, and is said to have done good service as a tonic and anti-periodic.—Amer. Jour. Phar., Feb. 1885, 89.

TAMARISCINEÆ.

Fouquieria Splendens—Proximate Analysis of the Bark.—Helen C. De S. Abbott has subjected the bark of this plant, abounding on the table-lands of the Mexican boundary line, and locally known by its Mexican name of

Ocotilla.—The plant is fully described in the proceedings of the Mexican Boundary Survey of 1859, and also in an article by Edward Lee Green, ("American Naturalist," 1880). The specimens of ocotilla, subjected to analysis by the author, were collected and transmitted from Lake Valley, Southwest New Mexico, through the kindness of Professor E. D. Cope. The portions of the stem, similar to those used in the analysis, vary in diameter from an inch to an inch and a half. The bark shows a thickness of over an eighth of an inch, and is of a sage color generally. The exterior surface is made rough by an interlacement of hard projecting material; some of the smaller stems are encircled with the gray thorns described, arising in regular series from the projecting portions of the bark. Between the interlacements are oblong and diamond-shaped intervals, which are filled with superimposed layers of a yellowish color and looking as if coated with a wax. They appear to be cemented together by a glistening substance, which on warming the bark, exudes and possesses a resinous or gum-like consistency.

The investigation was conducted according to the scheme proposed by Dragendorff, with the exception of the maceration at the ordinary temperature; an apparatus similar to the one devised by Tollens has been used for the extractions. The air-dried material reduced to a very fine powder was again dried at 100° C., giving 9.4 per cent. moisture. The great importance of powdering the material for the various estimations, as insisted upon by Dragendorff, was fully confirmed in these examinations. Quantitative determinations with ocotilla bark reduced to fine pieces gave 2 per cent. and 3.5 per cent. less than the percentage obtained from the estimations with the powdered substance. Determination of total ash gave 10.26 per cent.; a qualitative ash analysis showed the presence of calcium, magnesium, aluminium, potassium, sodium, and a trace of iron, sulphates, phosphates, and chlorides.

The results of the proximate analysis, as so far completed, may be stated as follows:

Moisture	9.4
Petroleum spirit residue	9.
Ethereal residue	4.52
Alcoholic residue	8.6
Water residue	19.11
Total ash	10.26
Alcoholic extract ash	00.15
	61.04

The difference of 38.96 per cent. would include pectose, coloring matter and cellulose or woody fibre. By the method followed out in this analysis, petroleum spirit extracted from the powdered bark a substance of constant melting point which is identified as a wax. It resembles, in ethereal solution not clouding on addition of alcohol, Bahia wax; in melting point and specific gravity, Carnaüba wax, also the latter wax by its insolubility in water and action with nitric acid. It differs from Carnaüba wax in its greater degree of solubility in absolute alcohol, ether, and aqueous alkalies. Linseed oil is an active solvent for it, but does not dissolve Carnaüba wax. The color reaction of the petroleum with sulphuric acid have been described above. It is stated that sulphuric acid produces no effect with Carnaüba wax.

The wax obtained from the bark of *Fouquieria splendens* differs generally in its properties from known vegetable waxes, and is evidently a new wax peculiar to this plant. The author proposes that it be called *Ocotilla wax*.

In the ether, absolute alcohol, and water extracts, the presence of an acid resin, a white crystalline substance, gum resin, glucose, possibly glucosides, gum, and a red coloring matter were indicated.—Amer. Jour. Phar., Feb. 1885, 81–88.

ROSACEÆ.

Blackberry Leaves—A New Substitute for Tea.—According to Dr. Otto Kunze, young blackberry leaves have exactly the same taste as genuine, good, Chinese tea leaves. Regarding the principle, theine, the author thinks that it plays only a neutral or indifferent part so far as the effects of the use of tea is concerned. [This supposition is, of course, directly opposed to the views held by all authorities.] The author, therefore, recommends blackberry leaves as a perfect substitute for genuine tea.—Amer. Drug., Feb. 1885, 36; from Zeitsch. f. Landwirthsch. Gew., 1884, No. 15, 115.

Alchemilla Arvensis—Value as a Diuretic.—A correspondent of Pharmaceutical Journal and Transactions (Mar. 28, 1885, 791) draws attention to this plant, commonly known under the name of "parsley piert," but called by him "breakstone parsley." The plant, he states, has been used very successfully as a diuretic in both acute and chronic dropsy by the late Dr. Brown, of Haverford West, during many years' practice, and its virtues, he thinks, should be more generally known. The diuretic properties of this plant are well known in Germany, where it is known as "Percepier." (?)

LEGUMINOSÆ.

Myroxylon peruiferum, Lin. F.—*Character of the Balsam.*—Mr. P. Macewan has examined a sample of what he calls the oleo-balsam or the red oleo, *oleo vermelho*, of Rio Janeiro, the results differing in several respects from those obtained by Th. Peckolt. In bulk the balsam was dark brown, and in thin layers dark red; its odor was smoky and feebly fragrant. On tasting it, a persistent choky and disagreeable feeling was left in the throat. The spec. grav. was .915. Petroleum spirit dissolved 63.7 per cent., leaving a light brown pulverulent resin undissolved, and on evaporation left an amber colored, faintly aromatic residue, which gave a red-brown color with nitric acid; Peru balsam left an insoluble cohesive resin, and the solution in petroleum spirit yielded a straw-colored fragrant residue, giving a yellow and pale violet-color with nitric acid. The oleo-balsam was completely soluble in alcohol and in ether, and partially soluble in carbon bisulphide, separating a flocculent brown resin which became adhesive to the sides of the vessel. The most marked difference between the two balsams is the behavior with sulphuric acid; on the subsequent addition of cold water to the mixture with Peru balsam, a beautiful violet color is imparted to the surface of the mass, while a gray color is produced with the oleo-balsam. The oleo-balsam has not the fragrance which is perhaps the most valued property of Peru balsam.—Amer. Jour. Phar., June 1885, 307; Phar. Jour. and Trans., March 21, 1885, 771.

Peruvian Balsam—Examination of Commercial Samples.—Mr. Peter Macewan records an examination of twelve samples of Peruvian balsam, and found only one of the twelve samples to be impure, whilst the varying character of a second sample may be accounted for by reason of its age. The author gives the method of examination in detail. It is noteworthy that he found the spec. grav. of the impure sample to be the highest (1.1476), that of the other samples being 1.1376, 1.1400, 1.1412, 1.1412, 1.1416, 1.1420, 1.1434, 1.1440, 1.1452, 1.1456, and 1.1456 respectively.—Yearbook of Phar., 1884, 578–586.

Myroxylon Fereiræ—Characters of Volatile Oil.—The volatile oil distilled from the fruit is described by Mr. E. M. Holmes as being almost colorless and of a sweet odor, recalling the fragrance of a field of beans in blossom. It is slightly altered by exposure to air, the odor approaching that of cedar wood. A solution of the oil in rectified spirit separates a white precipitate. The oil seems well fitted for use in perfumery, as it is not exactly like any known perfume.—Phar. Jour. and Trans., Dec. 20, 1884, p. 483; Amer. Jour. Pharm., May 1885, 248.

Mexican Sandal Wood Bark—Characters and Constituents.—Dr. H. Stieren draws attention to the bark of a tree which in Mexico and some of the Central American Republics, where it is indigenous, is used for fumigating purposes in churches, in place of frankincense, and which appears to be known under the above name. The author has been unable to obtain any particulars as to its source, but is strongly inclined to consider the tree to be some species of *Myroxylon* or *Myrospermum*. The bark occurs in irregular, more or less smooth or unevenly corrugated pieces, of a light whitish cinnamon color with dark, hard epidermis, and of an agreeable, custard-like smell, and aromatic, slightly acrid, balsamic bitterish taste. A small quantity, coarsely powdered and sprinkled over burning coals, emitted a balsamic, mixed aromatic odor, devoid of the pungency of burned frankincense. A thin cross-section manifested, at about 75 diam. linear, in the microscope, oil cells interstriated with apparently semi-viscid, resinous matter.

The author's experiments proved that the odorous principles rest in an oily substance, cinnamic acid and its combinations, and resinous matter. Benzoic acid, as a proximate principle, could not be identified, neither is there an alkaloid present in the bark. The peculiar action of potassic hydrate on the alcoholic extract, producing the exact coumarin flavor, deserves continued attention. Although, as a rule, not comparable to frankincense, which is a pure resin, and of a pronounced, strong and penetrating smell upon ignition, this bark, from its milder, but more aromatic odor, may be considered a good substitute for fumigation in churches; and the oleo-balsamic constituent, being contained in the bark to the extent of 15 per cent., will, no doubt, be found adaptable to many uses, and may eventually replace Peruvian balsam, than which it is much finer and more delicate.—Amer. Drug., Dec. 1884, 226.

Abrus Precatorius, Lin.—*Structure of the Seeds.*—The structure of the seeds has been described by W. Tichomiroff in a paper read before the Russian Society of Physicians and Naturalists at Odessa. They contain oil and granular albuminoids, but neither aleurone nor starch, and in the parenchyma sometimes crystals of stearic acid or hesperidin. The testa is composed of four layers, viz., (1) Rods, colorless in the red part, but purple-violet in the black spot; (2) Palisade cells, branching and at the lower end folded and of small diameter; (3) Parenchyma, tangentially elongated; (4) Albumen, the cells of the inner layer being flattened radially and at length coalescing into a homogeneous pellicle which cannot be decomposed into its separate cells by maceration in chromic acid, and which swells strongly in caustic potash. The hilum has two layers of rods and the palisade cells are replaced by sclerenchyma. By chloride of iron the presence of tannin can be recognized in the albuminous layer and rods.—Amer. Jour. Phar., May 1885, 248; Pharm. Jour. and Trans., September 6, 1884.

Abrus Precatorius—Preparation of Poisonous Spikes.—The poisonous spikes or "sui," which are used in the Punjab for poisoning cattle, according to Boverton Redwood, are prepared as follows: The shell of the seed is removed, the seed softened in water and pounded into a paste, which is then rolled out into little cylinders about ¾ inch long, sharpened at one end. After careful drying, the cylinders are further sharpened by being rubbed on a brick, and are finally soaked in animal fat. The suis are fitted for use into a wooden handle, from which the point just protrudes. Upon a blow being struck with this weapon, the point of sui penetrates the flesh, the sui being withdrawn from the handle into which it is loosely fitted, and remaining in the wound. Death ensues, on an average, in 48 hours.—Amer. Jour. Pharm., May 1885, 242; Phar. Jour. and Trans., Dec. 20, 1884, p. 483.

Abrus Precatorius—Correction as to Use of Seeds as Standards of Weight in India.—Mr. George Owen Chubb, in view of the meagre and isolated notices on the use of certain seeds as standards of weight in India, which are morever conflicting and misleading, has made a careful inquiry into the subject. He finds that although each province, and frequently each city, has its own set of these weights, yet all the systems agree in the following respects, viz: (1) In adopting as their unit a weight of which the seed of *Abrus precatorius* is the standard ; (2) in containing an octave of this weight, called a *massa*, and (3) in terminating the scale by a weight called the *tola*, which is equivalent to 96 units. This unit, representing the seed of *Abrus precatorius*, is usually called a *retti*, but at Bellary is known as a *gundi-mani*, and at Bombay, Deccan, Poona and elsewhere, as a *gunj*. The author has made weighings of the different varieties of *Abrus precatorius* seed from time to time, with a view to determining their average weight. He finds the *yellow seeds* the heaviest—average weight 2.036 grs ; the *white seeds* weigh, on an average, 1.732 grs.; the *red seeds* (the commercial article), 1.553 grs.; a sample of the same, direct from St. Vincent, 1.527 grs. The lightest are the *dark purple seeds*, from British Guiana, their average weight being 1.392 grs. From data furnished the author, he has constructed the following table of standards used at different stations :

	Retti. Weight in grains.	*Massa.* Weight in grains.	*Tola.* Weight in grains.	RATIO.	
				Massa.	*Tola.*
Tulnah	1.92	15.375	184.5	8.0078	96.0937
Ahmednuggar	1.95	15.7	188.4	8.0513	96.6154
Surat	1.95	15.6	187.2	8.0000	96.0000
Malwa	1.979	15.833	190.0	8.0005	96.0000
Ahmedabad	2.015	. .	193.44	. .	96.0000
Bombay	1.79	. .	179.0	. .	100.0000
Patna	3.05	18.5	209.0	6.0656	68.5246

At Bombay there are two *retti* in common use, one equivalent to 1.79 grains, used for weighing gold and silver ; the other, three grains, for weighing pearls.

The *massa* also represents a seed. The author is of the opinion that the seed so used is that of *Mucuna capitata*. Some seeds, all from the same fruit, were found to weigh 16.03, 16.36 and 17.92 grains respectively. It is stated by several authorities that the seed represented by the *massa* is that of *Phaseolus radiatus ;* but the author considers this a mistake, since these seeds, according to locality, weigh only from 0.5 to 0.8 grains, and he thinks it more probable that the seed of *Phaseolus radiatus* is that used for smaller weights under the name of *oourd* grains. Thus, at Tulnah, a city in the province of Hyderabad,

2 rice grains = 1 oourd grain = 0.48 grains.
2 oourd grains = 1 wheat grain = 0.96 grains.
2 wheat grains = 1 retti grain = 1.92 grains.

The seed of *Vigna pilosa* is also given as the oourd grain by some authors, but the average weight of this was found by Mr. Chubb to be 0.7565 grain. Finally, at Colactchy, a town in the province of Travancore, a weight called "*munjandie*," or "*muntatie*," is used. It weighs

3.9 grs., and its standard is the seed of *Adenanthera pavonia*, the average weight of the East Indian seed being almost identical with that of the weight. A sample of West Indian seed, from St. Vincent, however, is heavier, weighing 4.87 grains.—Phar. Jour. and Trans., April 11, 1885, 830.

Phaseolus limatus, Lin.—*Poisonous Variety in the Mauritius.*—It is stated that the

Pois d'Achery, a sort of kidney bean (*Phaseolus limatus*, L.), cultivated in the Mauritius, and used there as an occasional article of diet by the Creoles, exists in the form of two varieties; the one white, which is generally esteemed wholesome, and the other very prettily variegated, which is regarded as poisonous. The poisonous character of the latter is due, according to Drs. Davidson and Stevenson, to hydrocyanic acid, which is formed when the beans are macerated in water by a similar process to that by which it is produced in certain plants of the *Rosaceæ*, such as the almond and cherry laurel. The reason why two varieties of a plant which cannot be distinguished from each other by any definite botanical characters should produce different chemical compounds is a most interesting problem, and seems to deserve further investigation.—Amer. Jour. Phar., Sept. 1884, 475, from "Practitioner."

Phaseolus diversifolius, Pers.—*Medicinal Uses in the South.*—The "wild bean," reported by Dr. E. W. Lane to Dr. H.H. Rusby under the name of "King Cure-all", grown (in the Southern States) in sand, from an immense, stout, club-shaped root, which abounds in starch. It is reported as beneficial to dyspeptics, the root being chewed and the saliva swallowed. The doctor judges the benefit to be derived from the increased amount of saliva swallowed.—Amer. Jour. Phar., Feb. 1885, 90.

Bowdichia Major—*Alkaloidal Constituent.*—Mr. Petit draws attention to an alkaloid which he has isolated from a bark employed in Brazil in the treatment of fevers and rheumatic and gouty affections, under the name of

Sucupira.—This bark occurs in hard, thick fragments of a yellow-ochre color, having a very pronounced bitterness, and resembling yellow cinchona. It is derived from *Bowdichia major*, also known under the name of *Sebipira guacu.* The alkaloid is described as having stupefying and mydriatic action, and clearly defined chemical and physical properties.—Phar. Jour. and Trans., June 27, 1885, 1067; Nouv. Rem., June 1885, 824.

Coronilla Scorpioides—*Presence of a Poisonous Alkaloid in the Seeds.*—This leguminous plant, growing in the south of France, is reputed to be injurious to sheep that eat it. The seeds are very bitter, and some of them having been found among the refuse from the cleaning of barley used in a brewery, Messrs. Schlagdenhauffen and Reeb have undertaken an examination of them. They have succeeded in separating from an alcoholic extract a crystallizable alkaloid, an aqueous solution of which rapidly produces paralysis of all the organs in frogs, and which they consider to be the active principle of the seeds. An acidulated aqueous solution, precipitated with iodo-iodide of mercury, gives a crystallization of kermes-brown needles, which after a few minutes are changed into a mass of very delicate deep green needles, having a brilliant iridescence.—Phar. Jour. and Trans., Nov. 29, 1884, 43; Jour. Pharm. Alsace-Lor., Oct. 1884, 319.

Eperva Falcata—Histological and Chemical Examination of the Wood.—Mr. Carl Mezger has made an elaborate histological investigation of the wood of *Eperva Falcata*, Aublet, which is said to yield the oily product introduced into medicine under the name of "Balsamum anthartriticum indicum." The results of the author's chemical investigations, which for want of material are incomplete, have determined the presence of free butyric acid and of an acid resin. Volatile oil could not be found. The paper is illustrated by numerous cuts showing the anatomical structure of the wood.—Arch. d. Phar., Dec. 1884, 873–889.

Soja Hispida—Proximate Constituents.—E. Meissl and F. Böcker give the composition of soja bean, in round numbers, as follows: Water 10, soluble casein 30, albumin 0.5, insoluble casein 7, fat 18, cholesterin etc. 2, dextrin 10, starch 5, cellulose 5, ash 5 per cent., traces of sugar and amido-compound.—Amer. Jour. Phar., Feb. 1885, 108, from Jour. Chem. Soc., 1884, 918; Bied. Centr., 1884, 52.

Copaiba—Microscopical Determination of Purity.—In Rundschau-Leitmeritz (x. p. 598,) it is recommended to place a drop of the copaiba on a slide, and dust in a few grains of canna starch. If pure, the starch granules will be invisible; if the copaiba, however, be adulterated, its altered refractive power will cause the starch to become visible.—Amer. Jour. Phar., Jan. 1885, 27.

Copaiba—Influence upon the Urine.—Dr. H. Quincke states that after the administration of copaiba, the urine, when treated with hydrochloric acid, acquires a light red, afterwards purple tint, which gradually passes into violet and later is yellowish-red. Nitric and concentrated sulphuric acid act similarly, but these acids appear to favor the rapid decomposition of the coloring matter. Urine containing this coloring matter ("copaiba-red"), whether treated previously with hydrochloric acid or not, reduces alkaline copper solution, though the previous treatment with the acid delays the separation of cuprous oxide. Knapp's solution (of bismuth), however, is not reduced. This "copaiba-red" is regarded by Dr. Quincke as an acid which yields easily soluble, colorless salts, only decomposable by mineral acids. The same author also observed that the addition of hydrochloric acid, besides producing the above-mentioned red color, also caused the separation of a resinous substance, at first colorless, but gradually becoming muddy-violet, which substance he supposes to be formed from the copaiba red.—Amer. Drug., Feb. 1885, 31; from Arch. f. Exper. Pathol.

Acacia Homalophylla—Characters of the Wood.—According to Dr. H. Stieren, this wood, which on account of its peculiar odor is called *Violet Wood*, occurs in commerce in smoother or rougher pieces, exhibiting bark, bast, young wood, and core, of a light or dark brown color. The scent, particularly upon friction, reminds one of violets proper rather than of orris. It was ascertained that the most highly scented part of the wood is the centre, of a deep brownish red color, with purplish tinge, remotely resembling black walnut; the younger wood, of a whitish color, possessing only a faint smell, which slightly increases again in the bast and bark; the bast is of a yellowish-brown, and the bark of a deep brown color. The author's experiments make it apparent that the persistent odor of the wood rests entirely in a gum resin with oleo-resin, and the wood might find its best application in the composition of sachet powders, its odor being so persistent.—Amer. Drug., Nov. 1884, 204.

Cassia Absus, Lin.—*Use of the Seed.*—Attention has recently been called again to the seeds of this plant, which have long been used in the East for granular conjunctiva under the name of *chichem* or *schimsch*, and occasionally in Europe as *semen cismæ*. The plant is an annual, indigenous to the East Indies and westward to Central Africa; the rather narrow glandular-pubescent legume contains 5 or 6 seeds, which resemble flaxseed, are flattish-ovate, glossy, brownish black, and have a somewhat aromatic odor and a mucilaginous, disagreeable and bitter taste. J. J. Virey, in "Jour. de Phar.," May 1823, described the application as follows: The seeds are well washed, then dried, finely powdered, and mixed with an equal quantity of sugar; a small portion of this powder is dropped or blown into the diseased eye, which is then closed. The powder is of rapid action, and irritating, and should not be used in the inflammatory stage of the disease; according to Frank, its activity is increased by the addition of turmeric.—Amer. Jour. Phar., June 1885, 295.

Cassia Occidentalis—Constituents of the Seeds.—Dr. H. Stieren states that the seeds of this plant, which is occasionally found in the Southern States, contain *no* caffeine, nor any other alkaloid, but some fatty oil which easily becomes disengaged and empyreumatic upon application of heat to the seeds, in a partially-closed vessel. The parching or toasting of the seeds causes volatilization of water contained therein; then the oily substance makes its appearance on the walls of the container, accompanied by an odor closely resembling that of parched beans or peas; very remotely, and with some imagination only, simulating that of coffee.

Treatment of the parched seeds with dilute alcohol, as also the turbid, brown watery extract, developed the presence of phosphates of lime, potash and soda.—Amer. Drng., Nov. 1884, 204.

Senna Leaves—Isolation and Characters of Cathartic Acid, which see under "Glucosides."

TEREBINTHACEÆ.

Rhus Toxicodendron—Remedy for Poisoning.—Mr. T. S. Wiegand draws attention to "Fluid Extract of Serpentaria," as a remedy which has been successfully employed in rhus poisoning. It is best applied by placing cloth moistened with it upon the affected parts, without any friction. Two or three applications generally effect a cure.—Amer. Jour. Pharm., July 1884, 355.

Sumach—Cultivation in Italy.—Mr. W. T. Thiselton Dyer draws attention to the cultivation of sumach in Italy, as described by Professor Inzenga, and suggests that if might be profitably introduced in Australia. The plant is by no means a delicate one, and seems well adapted to warm, dry countries. The branches of the sumach have to be removed in harvesting, with some care. They must be cut off parallel to the main stem with a clear circular section, or otherwise the stump will decay, and the lowest buds must be left uninjured. This is accomplished by the use of a pruning hook or knife of a peculiar shape, called a "ronco." The harvesting takes place in July, and the sheaves of branches, after drying in the fields, are removed to the threshing floor, where they are threshed with a flail, called a "bovillo."—Phar. Jour. and Trans., April 18, 1885, 852.

JUGLANDACEÆ.

Walnut Bark—Vesicating Properties.—A writer in the "Cronica Médica," of Lima, draws attention to the vesicating properties of the inner bark of the walnut tree. Having steeped a piece about two inches square in vinegar for about a quarter of an hour, and placed it upon his arm before going to bed, so much pain resulted that after an hour he was compelled to remove it. In the morning the pain had disappeared, but his arm showed three large blisters covered with blackened skin. He has tried it in another case with good effect.—Phar. Jour. and Trans., June 27, 1885, 1066; Lancet, June 6, 1885, 1051.

CORIARIACEÆ.

Coriaria Ruscifolia—Poisonous Characters.—Mr. T. H. Hustwick draws attention to this plant, indigenous to New Zealand, where it is known as the "tu-tu" plant (pronounced "toot.") It grows luxuriantly where situation is favorable, and prefers an exposed site on rising ground, with a dry, friable soil; its average height, when mature, may be taken at about 5 feet, of a shrubby, herbaceous character, and with its spreading branches covering a considerable extent of surface. Surrounded by sombre ferns and withered grasses, the effect of its glossy dark green foliage is very striking.

Tu-tu, though commonly spoken of as a poison, is such only under certain conditions, and even not then to all animals; the horse, goat and pig being said to be entirely proof against it under all circumstances; while, conditions being favorable, cattle and sheep often fall victims to it. The season of its greatest activity is in spring; then, the wide-spreading roots throw up numerous tender, succulent shoots, which are eaten with avidity by sheep fresh from the hills, where dry grasses and ferns have been the rule. Cattle browse on the young leaves, and when coming to them fresh from other pastures, or exhausted by labor or travel, nearly always with fatal effects. It is said that later in the year the poisonous property is greatly diminished; that even when most virulent, its effects are much ameliorated by a previously full stomach, and that the system can become accustomed to it by gradual use. Animals suffering from the effects of this plant are said to be "tooted." The author is not aware what is the effect of the green herb on man, but singularly enough, the "berries" when ripe are grateful and refreshing to the thirsty palate, care being taken to reject the seeds. A common method of utilizing the fruit is by tying a few bunches in a handkerchief and sucking the juice through it. Small birds are very partial to the ripe fruit, and no injurious effect on them is apparent; most probably the seeds are voided by them entire.—Amer. Jour. Phar., Aug. 1884, 439–440; from Phar. Jour. and Trans., July 12, 1884, 22.

PIPERACEÆ.

False Cubebs—Characters of Distinction.—False cubebs have been offered in the London and New York market. In 1861, Gronewegen referred a false cubeb to *Piper anisatum*, Humb. and Bonpl.; and Stillé and Maisch (Nat. Disp., 2d edit., p. 479; 3d edit., p. 522) consider this to be probably the same which Flückiger and Hanbury (Pharmacographia, 2d edit., p. 588) refer to *Piper crassipes*, Korthals. Wm. Kirkby finds the description of the latter to differ from that of the drug under notice, in that the stalk of *P. crassipes* is one and a half times to twice as long as the berry, and that the taste is very bitter. A fruit seen by Kirkby in Kew Gardens, said to be from *Piper sylvestre* (?) Lam., closely resembles this false cubeb, but has a lighter color, a longer terete stalk, an odor reminding one of pepper, and a taste not aromatic. Kirkby's description of cubebs and the false drug, arranged for convenient comparison, is as follows:

Cubebs.	False Cubebs.
Spherical, somewhat pointed at the apex, reticulately wrinkled, contracted at the base into a stalk.	Like cubebs, but more strongly wrinkled.
Color brownish gray or blackish.	Color brownish gray to brown, rarely approaching black.
Odor aromatic, spicy, and characteristic.	Odor rather pleasant, resembling mace.
Taste pungent, aromatic, slightly bitter.	Taste aromatic, warm, somewhat bitter.
Diameter 3 to 5 mm.	Diameter 4 to 6 mm.
Stalk 5 to 9 mm.	Stalk flattened, 4 to 7 mm.
Pericarp in three layers. Exterior one, beneath the epidermis, an interrupted row of cubic, tkick-walled cells, in groups of three or four. Middle layer broad, made up of loose, undeveloped tissue, containing stellate groups of needle-shaped crystals and large quantities of starch, and interspersed with larger oil cells, the latter colored red-brown with concentrated H_2SO_4; a section kept in glycerin for several weeks shows large groups of prismatic crystals, concentrically arranged. Inner layer consists of about four rows of parenchyma cells, tangentially elongated, and an outer margin of 11 or 12 wood bundles, formed mostly of narrow spiral vessels, with few dotted vessels.	Pericarp in three layers. Exterior one, an interrupted ring of thickened cells, little larger than in cubebs. Middle layer composed of loose parenchyma, containing starch less abundantly than cubebs, and interspersed with oil cells, the latter colored red with H_2SO_4; a section does not yield crystals. Inner layer free from starch, composed of ten rows of tangentially extended thin-walled cells, and an outer margin of 14 or 15 wood bundles, formed of narrow spiral vessels, with few dotted vessels.

In both drugs the testa consists of one row of large, encrusted, thick-walled cells, elongated and radially arranged, and containing calcium carbonate. Surrounding the perisperm is a red membrane formed of rather large cells, and lining this is a thin colorless structure similar to it, but composed of smaller cells.

The perisperm is made up of angular parenchyma containing starch and oil, the oil cells colored red-brown by H_2SO_4; thin sections kept in glycerin for a few weeks, form thin plates of crystals in the perisperm of cubebs, but not in false cubebs.—Phar. Jour. and Trans., Feb. 14, 1885, p. 653.

Piper Angustifolium—Examination of the Stearopten (*Matico-Camphor*), which see under "Organic Chemistry."

RHAMNACEÆ.

Rhamnus Purshiana—Proximate Constituents.—Mr. Limousin expresses an opinion that the four resinous principles separated from the bark of *Rhamnus Purshiana*, or "cascara sagrada," by Professor Prescott, were all more or less derived from chrysophanic acid, which he has observed to be present in it in notable quantities. He states that if the slightly-grated surface of the bark be touched with a drop of strong solution of ammonia or caustic potash, there is an immediate fine red coloration, which he considers an incontestable indication of the presence of chrysophanic acid. The bark appears to contain a large proportion of tannin, as a drop of perchloride of iron produces an intensely black spot, whilst it scarcely blackens rhubarb. The bark yields a yellowish powder resembling that from rhubarb, which like it becomes colored in the air, especially in an ammoniaca latmosphere. Mr. Limousin expresses a preference for a tincture of the bark prepared according to the Codex formula for tinctures as compared with the fluid extract of the U. S. Phar.—Jour. d. Phar. et Chim. (5), vi., 80; Phar. Jour. and Trans., Jan. 31, 1885, 615.

Colubrina Reclinata—Proximate Analysis of the Bark.—Messrs. William Elborne and H. Wilson have subjected the bark of *Colubrina reclinata*, a native of South America, and known in the West Indies as "Mabee bark"—to proximate analysis, and give the following description. It occurs in flat pieces and quills, about six inches long, about one-eighth of an inch thick, and has a very compact structure, short and resinous fracture, and ashy-grey color. The flat pieces resemble somewhat in appearance cusparia bark, from which the periderm has been removed. Free from odor; taste bitter at first, subsequently developing into an agreeable sweetness. A transverse section displays a remarkably thin epiphlœum of brown tabular cells; the remaining structure consists of the usual six-sided cells containing starch grains, traversed with other layers of cells presenting a green color, which, examined by high power, are found to contain large crystals, probably oxalate of calcium, together with fat. The result of the proximate analysis of the bark is recapitulated by the authors as follows:

Moisture	6.3
Ash	6.8
Chlorophyll and fat	2.2
Tannin	8.9
Crude bitter principle (glucoside)	9.7
Mucilaginous substances	10.25
Albuminous substances	6.0
Fibre, etc.	49.85
	100.00

The bark is largely used in the West Indies for the preparation of a stomachic drink of great merit.—Phar. Jour. and Trans., April 11, 1885, 831.

AQUIFOLIACEÆ.

Ilex Cassine, L.—*Determination of Caffeine as a Constituent.*—Dr. Venable has determined the presence of caffeine, to the amount of 0.27 % in the leaves of *Ilex Cassine*, L.—Jour. Amer. Chem. Soc., April 1885, 100.

EUPHORBIACEÆ.

Alveloz—A New Remedy for Cancer.—*Alveloz* is the name of a plant which has been sent by the American Consul at Pernambuco to the State Department, with the statement that it belongs to the *Euphorbiaceæ*, and that several cases of alleged cancer had been cured by its application. Unlike condurango, which was an alleged internal remedy for cancer and syphilis, alveloz is an external application. Its mode of operation is similar to that of jequirity. A profuse suppuration follows its application to a granular surface. The drug was used in Washington by Dr. Smith Townshend in a case of lupus of the nose, which was of nearly forty years' standing, and had resisted all previous treatment. The ulcer was cured within a few days.—*N. Y. Med. Jour.*

Dr. J. A. Velloso gives an account of the trials made with the new cancer cure. It consists of the milk of an *Euphorbiaceous* plant, belonging apparently to the section which has fleshy stems like the cactus. The plant is known by the name of "alveloz." Dr. Velloso tried it in the Hospital Pedroij, on two patients, one with fibroplastic canceroid on the nose, and the other suffering with epithelioma on the lip, the first being cured in forty days, and the second in less than two months. The best method of employing it is to apply a slice of the stem of the fresh plant to the part to be destroyed, and when it has deposited a layer of milk on the wound, the part affected is left exposed to the air twenty-four hours, subsequently the wound is washed with tepid infusion of tobacco, and after some minutes covered with lint moistened with arnica and water. Twenty-four hours after, it is again moistened with the same infusion, and then a fresh application of the juice of the plant is made. No internal remedies are given. The action of the juice is irritating, causing local inflammation, the intensity of which appears to be kept within proper bounds by the use of tabacco infusion.—Jour. de Recipe; Phar. Jour. and Trans., Sept. 1884, 245.

"*Alveloz*"—*Botanical Source, etc.*—The alveloz plant has been cultivated in a green house at Sydenham, but produced only a few flowers, most of which dropped off before arriving at maturity. The stem of the plant is fleshy, smooth and cylindrical, about one-third of an inch in diameter; the leaves are smooth, pale green, lanceolate oblong, with a cordate base, sessile and alternate. The flowers are small and green, and the involucre has four wedge-shaped lobes. The flowers have been submitted to Boissier, one of the best European authorities on the genius *Euphorbia*, and, so far as can be gathered from the imperfect state of the flowers, he has decided that it belongs to the genus *Euphorbia*, and to a species not described in Martin's "Flora Brasiliensis," but almost certainly belonging to the section *Dichilium*, and nearly allied to *E. anomala*, Salzm. (*E. insulana*, Veloso).—Phar. Jour. and Trans., Dec. 27, 1884, 504.

Euphorbia Pilulifera, Lin.—*Proximate Analysis.*—This plant, which has long been in use in tropical countries for various complaints, and has lately been introduced here as a remedy in asthma, was analyzed by Charles G. Levison, Ph. G., San Francisco, Cal. (Amer. Jour. Phar., Mar. 1885, 146–147), with the following results, expressed in *per cent.*:

	Per cent.	
Moisture	25.00	
Amount soluble in ether, .725		15.00
" " alcohol, .820		5.75
" " water		16.60
Insoluble residue, consisting of cellulose, lignin and silicious earth, etc.		62.65
		100.00
Ash	20.00	
Amount soluble in water, including potassium, sodium and magnesium, phosphates, sulphates, chlorides and carbonates		7.50
Amount soluble in diluted HC, including calcium phosphates		3.50
Insoluble residue, consisting principally of silica and sand		9.00
		20.00
Amount extracted by ether, .725	15.00	
Resin soluble in chloroform, CS_2, glacial acetic acid; glucoside		2.50
Wax, non-volatile, soluble in CS_2, chloroform, benzin and boiling 90 per cent. alcohol, and insoluble in cold alcohol		6.00
Chlorophyll		.25
Insoluble residue		.75
Ash of extractive		.50
Volatile matter driven off by heat		5.00
Tannin		Traces
		15.00
Amount extracted by alcohol	5.75	
Resin, glucoside, soluble in 90 per cent. alcohol, and insoluble in chloroform, ether and petroleum benzin		3.00
Resin, glucoside, soluble in 75 per cent. alcohol; insolubilities, ditto, as above		2.00
Rusin, glucoside, soluble in 50 per cent. alcohol; insolubilities, ditto.		.50
Ash of extractive		.25
		5.75
Amount extracted by water	16.60	
Starch colored blue by iodine and reducing Fehling's solution		5.30
Albumen soluble in acetic and phosphoric acids, and insoluble in nitric acid and alcohol, and coagulated by heat of 154°F.		2.50
Pectin coagulated by alcohol		1.30
Gum insoluble in alcohol and soluble in water		1.70
Protein substance similar to albumen and not coagulated by heat.		5.80
		16.60

Euphorbia Pilulifera—Use in Asthma.—Dr. C. C. Baker reports his use of this plant in two cases of asthma. The results in both were very prompt and satisfactory. This tropical weed has been long used in aphthæ and as an alterative. As far as may be judged from the sensible properties, the virtues of the plant are probably not superior to those of the closely allied indigenous weeds, *Euph. maculata* and *hypericifolia.* A western species, *Euph. humistrata*, Engelmann, appears to be in popular use in some localities as a remedy for bowel complaints.—Amer. Jour. Phar., Sept. 1884, 475, from Therap. Gaz.

Kamala—Inorganic Impurities in the Commercial Article.—Messrs. P. W. Squire and R. A. Cripps, having found a large proportion of ash in a sample of kamala, largely in excess of the percentage usually stated (4 to 6 or 8 per cent.), were induced to examine a number of commercial samples, only one of which yielded an ash within the above percentages. All the others yielded a very much larger quantity. The ash in most cases consisted of a reddish sand, but its composition was not determined, while the best sample left a grayish ash, about one half of which was insoluble in hydrochloric acid :

Sample.	Amount of ash.		Color of ash.
A	25	per cent	Reddish.
B	13.5	"	Greyish.
C	61.5	"	Reddish.
D	24.0	"	"
E	59.6	"	"
F	40.3	"	"
G	46.2	"	"
H	47.3	"	"
I.	30.3	"	"
J.	6.02	"	Greyish.
K	26.7	"	Reddish.
L	47.6	"	"

—Amer. Jour. Phar., Mar. 1885, 141, from Phar. Jour. and Trans., Feb. 14, 1885, p. 654.

Croton Morifolius.—Purgative Character of the Oil of the Seeds, etc.—Messrs. Dugees and Armendaris report experiments made with this Mexican plant, known by the name of

Palillo.—Two or three drops of the oil contained in the seeds act like a moderate dose of castor oil. The natives of Mexico use the leaves of the plant in the form of infusion as a remedy for gastralgia and atony of stomach. The tincture of the leaves is said by the above-named experimentalists to give excellent results in neuralgia, especially when occurring in the face, either when used as liniment, or dropped into the ears, or taken in the dose of 10 or 15 drops in orange-flower water.—Amer. Jour. Phar., Sept. 1884, 476, from Bull. Soc. Bot. (2), v., 233.

Buxus Sempervirens, Lin.—*Separation of a New Alkaloid.*—G. A. Barbaglia has separated from the leaves and twigs of the box a fourth alkaloid, which he names *parabuxinidine.* It crystallizes in thin colorless prisms, is insoluble in water, soluble in ether, freely soluble in alcohol, colors turmeric paper deep red, and gives with an alcoholic solution of oxalic acid a heavy white precipitate consisting of minute colorless rhombic plates.—Amer. Jour. Phar., March 1885, 145; Ber. d. Chem. Ges., 1884, 2655.

Elæococca cordata.—Characters of fixed oil, which see under "Organic Chemistry."

URTICACEÆ.

Cannabis Indica—Examination in Reference to Active Constituent.—Messrs. Warden and Waddle, surgeons in India, have subjected flowering tops of Indian hemp of known activity to examination, with a view to determine the nature of the active principle. Operating by the method of Dr. Hay for the isolation of the crystallized alkaloid described by him, they obtained a small quantity of substance, which should have contained all the alkaloid, but which proved to be without effect when injected into the stomach of a young cat. A portion of Indian hemp was also subjected to destructive distillation, and a nicotine-like principle separated from the oily product of decomposition. It formed salts which evolved a strong nicotine-like odor when acted on by alkalies. But physiologically it was found to be inert, and, therefore, was evidently not identical with nicotine.

The oil as a whole was also found to be devoid of any narcotic or irritant qualities. About one-eighth of an ounce was introduced into the stomach of a cat without producing any sensible effect. These results do not coincide with those of Personne, who asserted that the active principle of the plant resided in the volatile oil. It is just possible that the active principle was decomposed by the high temperature necessary for destructive distillation.

The principle which represents the full activity of the plant has yet to be isolated. If the active principle be a body which is actually distinct from the resin, the fact of its being so intimately associated with the resin renders its separation a matter of peculiar difficulty, for it is remarkably difficult to deal chemically with resinous compounds.—Amer. Jour. Phar., May 1885, 264–266; Phar. Jour. and Trans., January 17, 1885, 574.

Cannabis Indica—Value as a Local Anæsthetic.—Mr. A. Aaronson states that Cannabis indica is a perfectly satisfactory local anæsthetic. He has extracted with its aid as many as twenty-two teeth and stumps at one sitting. His plan is to dilute the tincture some three or five times, according to the probable duration of the operation. The diluted tincture is then applied in cotton wool to cavities, if such exist, and also about the gums of the affected teeth. The beaks of the extracting forceps are also, after being warmed, dipped in the diluted tincture. In cold weather, it is wise to dilute the cannabis indica with warm water. His patients acknowledge the immunity from pain they enjoyed during the extraction, and all expressed surprise and pleasure at the simplicity of the performance. The ordinary methods of anæsthetizing are subject to danger; this is as effectual, and is devoid of the possibility of harm.—Chem. and Drug.; Jour. Dent. Science, Nov., 1884; Amer. Drug., Jan., 1884, 4.

Hops—New Variety.—A new variety of hop has recently been exhibited by Prof. Max Cornu at the National and Central Horticultural Society of France, in which the lower leaves do not fall off as in the common hop. It is of very rapid growth, forming tufts upwards of twenty-three feet in height in one year. It is of Japanese origin, and was raised from seeds—Gard. Chron., Dec. 1884, 721; Phar. Jour. and Trans., Dec. 27, 1884, 504.

Hops.—Presence of *Choline*, which see under "Organic Chemistry."

MONIMIACEÆ.

Boldoa Fragrans—Isolation of a Glucoside.—Mr. P. Chapoteaut has isolated a glucoside from *Boldoa fragrans* as follows: The leaves are treated with boiling alcohol, the solution evaporated to dryness, and the residue extracted with very dilute hydrochloric acid in order to remove the alkaloid described by Bourgoin and Verne. The liquid, freed from the greater part of the mucilaginous matter, is then treated with ether or chloroform, and this ethereal or chloroform solution, on evaporation, leaves a transparent amber-colored syrup with an aromatic taste and smell. This substance, which exists in the leaves to the extent of 0.3 per cent., has the composition $C_{30}H_{52}O_8$, and can be distilled in a current of steam, but cannot be distilled without decomposition in a vacuum or in a current of hydrogen. When heated with very dilute hydrochloric acid, it yields glucose, methyl chloride, and a syrupy substance of the composition $C_{19}H_{26}O_3$, which dissolves in alcohol and benzene, but is insoluble in water. If the benzene solution is treated with sodium, hydrogen is evolved; and if the sodium-derivative thus formed is treated with alcoholic iodides, methyl or ethyl derivatives can be obtained. The substance, $C_{30}H_{52}O_8$, is therefore a glucoside or, rather, an ether in which glucose plays the part of an acid. The constitution of the alcoholic constituent has not yet been ascertained.

When the glucoside is injected under the skin of a guinea-pig, or taken into the stomach of a dog, it produces a quiet sleep of longer or shorter duration. If injected into the blood of the dog, it excites and increases the secretory functions, especially the secretion and excretion of bile, saliva, and urine.—Amer. Jour. Phar., Nov. 1884, 580, from Compt. Rend., 98, 1052–1053.

CUPULIFERÆ.

Cork—Conversion into Bricks.—According to Annales Industrielles, cork bricks, which are now being employed for various purposes, such as for coating steam boilers and ice cellars, and for many other purposes, are thus made: The cork is freed from woody particles and other impurities by a winnowing process; the wind from the ventilator throws the cork into a second machine, where it is cut to pieces, and is thence drawn up in buckets and ejected into a mill, where it is ground to an impalpable powder, which is then kneaded up with a suitable cement, and pressed into bricks. The cork bricks are first dried in the air, and afterwards by means of artificial heat. They are hard, and not liable to decomposition, and keep off moisture, heat, cold, and sound.—Amer. Drug., Feb. 1885, 36; from Chem. and Drug.

CONIFERÆ.

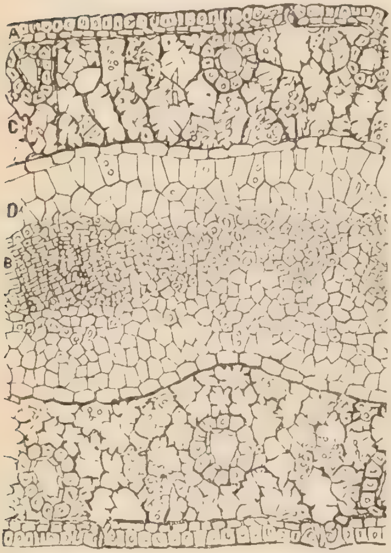
Pines—Distribution in the South, etc.—Dr. Charles Mohr has contributed a very elaborate paper on the distribution of the different species of pines yielding turpentine in the Southern States. The genus *Pinus* is restricted to seven species in the southern part of eastern North America, some of which are confined exclusively to the South. Of these seven species, *Pinus inops*, L., and *P. mitis*, Michx., extend farthest to the north; *P. glabra*, Walt., is confined to a small strip extending between the 31st and 32d parallel from South Carolina to the Mississippi; *P. serotina*, Michx., is found in the swampy lowlands of the Atlantic coasts from North Carolina to southern Florida. These four species occur in larger or smaller number, distributed throughout the southern forests, while the remaining species, which are characterized by their large yield of turpentine, form the immense pine forests of the South. They are *P. Cubensis*, *C. Tæda* and *P. australis*, the last-named being the most important, being known under the names of Long-leaf Pine, Southern Pitch Pine, and Hard Pine. The author gives a full description of the botanical characters of these different species, together with the methods of collecting turpentine, distillation of the oil, and utilization of the different products of the trees, for which reference must be had to the original in "Pharm. Rundschau," Aug. and Sept. 1884, 163–166 and 187–190.

Pinus Sylvestris—Phenol a Normal Constituent.—Mr. A. B. Griffiths has found phenol in this tree, the quantity present in the different parts being in the old stem 0.1021, in the young stem 0.0654, in the leaves between 0.0936 and 0.0315, and in the cones between 0.0774 and 0.0293 per cent.—Amer. Jour. Phar., Feb. 1885, 106; from Chem. News, vol. 49, 95.

Pine or Forest Wool (Wald-Wolle, Laine de Bois)—Microscopical Characters and Substitutions.—Mr. Thomas Greenish, after recounting the history of this curious article, which was first introduced about the year 1840, gives the results of some microscopical investigations of the substance, as well as of various fabrics bearing its name. All authorities to which the author has had access agree as to its origin—the pine leaf—and that it is a fibrous substance. Several samples of the true pine or forest wool, were found to be more or less coarse, of a reddish-brown color, and, subjected to a careful histological examination, were found to be composed of the tissues of the pine leaf.

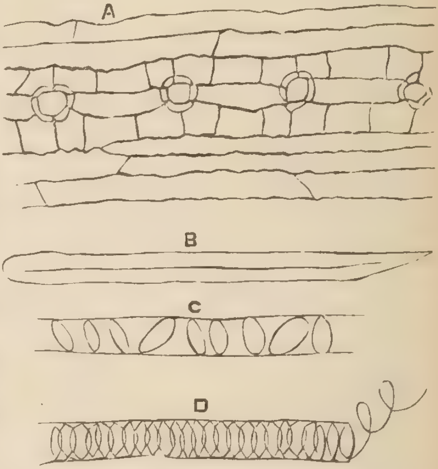
Fig. 54 is a transverse section of the leaf of *Pinus sylvestris*, and presents to the naked eye three very distinct tissues: *A*, the epidermal layer; *B*, the fibro-vascular bundles, composed of bast and wood cells; *C*, the parenchymatous chlorophyll tissue, with the oleo-resin secreting cells; and *D*, the parenchymatous tissue surrounding the vascular bundles.

FIG. 54.



Pinus Sylvestris. Leaf. Transverse section.

FIG. 55.



Pinus Sylvestris. Leaf. Elements of tissue.

Fig. 55 shows the tissues of which these fibrous substances are composed: *A*, the epidermal tissue, a series of elongated cells alternating with a series of tabular cells, the latter containing the stomata; the side walls have an undulating outline, so that the adjoining cells fit into each other. The parenchymatous tissue within the epidermal layer and that surrounding the vascular bundles (fundamental tissue) being thin and delicate, is for the most part disintegrated and destroyed in the process for the preparation of the wool, leaving the more tenacious epidermal cell tissue (*A*) with the fibro-vascular bundles, represented by *B* the bast cell, and *C* and *D* annular and spiral vessels, as the component parts of this fibrous material.

The several tissues of each sample were found to correspond with those in the leaf of the pine; there was no tissue found that had not its counterpart in the pine leaf, and the pine leaf being equally examined had no tissue that was not present in the samples of this fibrous material.

It is therefore evident that this fibrous substance, to which the term pine or forest wool was originally applied, and to which it now applies throughout Germany, the birth-place of the industry, is manufactured from the acicular leaves of one or more species of pine previously exhausted of its volatile oil and extractive in the process of boiling.

There is now in English commerce a fibrous article, in sheets like cotton wool, to which the same names of pine or forest wool, pine and fir-tree wool, pine-leaf wool, are indifferently applied. Samples of this substance were obtained from different sources, but they so clearly correspond that they pointed to one common origin. They were subjected to a micro-chemical and microscopical examination, with the view of determining the true nature of an article which is just now, as a fibrous material, and also as forming textile fabrics, receiving more or less of attention from the medical profession as well as the public.

The samples were composed of fine fibres of a reddish-brown color. When boiled in water the color was not affected. Boiled in a solution of caustic alkali, a faint pine leaf odor was perceptible and the color was partly discharged. A solution of chlorine completed the bleaching process, leaving a white fibrous material which was afterwards washed and dried.

A few threads only of the bleached fibres were used for the application of the following reagents:

Chloro-iodide of zinc produced a violet tint. A solution of iodine, followed by sulphuric acid, gave a blue color. The fibres dissolved completely in a solution of ammonio-oxide of copper. The results from these simple experiments were sufficiently convincing that the fibres in question consisted of pure cellulose, and not that altered or lignified condition of cellulose which the fibrous materials previously referred to show under the same reagents.

It will be understood that these experiments were conducted under the microscope, and that two or three fibres only were used on each occasion, so that the observer was enabled to follow the delicate reactions which were not visible to the unaided eye. The individual fibres were then placed under the microscope, aided by polarized light, and from their physical characters, which confirmed the results of the previous chemical reagents, it was evident that they were neither more nor less than the unicellular hairs on the outer coat (*testa*) of the seed of *Gossypium* which constitute ordinary cotton, whose habitat is not Thuringia, but rather the Southern States of America or one of the other cotton-producing countries of the East, and that it owed its brown color not to extractive from the pine leaf, but to the application of the usual dyeing material for that purpose. That peculiar epidermal cell tissue which characterizes the pine leaf was entirely absent.

In addition to this fibrous article now described, there is another material called "pine foliage forest wool flannel," hygienic flannel, also "from the forests of Thuringia," claiming public and professional patronage. It professes to be made from the fir wool, the produce of the Black Forest fir, *Pinus sylvestris*. This is a woven material of the same color as that previously described. The warp was detached from the weft in order that they might be examined separately; the warp when the dye was removed corresponded in every respect with the fibre previously examined, and behaved in a like manner with the same reagents; in fact it was cotton. The fibres of the weft were next examined. In burning they gave off that peculiar horny empyreumatic odor indicating an animal origin; boiled in caustic alkali they were completely dissolved; examined under the microscope the imbrications on the individual hairs proved previous suspicions to be correct, that this fibre consisted of wool. The woven material was, therefore, a combination of ordinary cotton and sheep's wool, the former probably rather preponderating.

These fibrous materials profess to owe their origin to the leaves of the *Pinus sylvestris;* but the venation of most of the Coniferæ is simple, one single unbranched midrib, and the only available true fibres are the fibro-vascular bundles of this midrib, which are surrounded by parenchymatous tissue. The fibro-vascular tissue of the midrib shows with the previously-mentioned reagents a distinct difference from that of cotton.

Some eminent members of the medical profession have spoken favorably of the pine-wool productions. Whether or not they deserve the high encomiums passed on them, must be decided in the future. It is nevertheless an important fact that a material, before considered almost useless, is now converted into articles of utility. It is used as wadding and for upholstering; can be spun and woven, yielding a strong yarn and cloth that may be used for carpets, horse blankets, etc.—Amer. Jour. Phar., Feb. 1885, 99–105; from Phar. Jour. and Trans., Nov. 15, 1884, 381.

B. Animal Drugs.

Sponge—Analysis.—Mr. Edward C. C. Stanford gives a resumé of the percentages of iodine and bromine, etc. found by previous experimenters in burnt sponge, and communicates the results of his analysis of two samples of fine sponge, as follows:

	Fine Turkish.		Honeycomb.	
Water	19.40		19.40	
Organic matter	69.39		50.24	
Ash soluble in water	2.21	Ash, 11.21	3.70	30.26
Ash insoluble in water	9.00		26.66	
	100.00		100.00	
Iodine	.200=4.48 lbs. to ton.		.054=1.2096 lbs. to ton.	
Iodine on sol. salts	9.050		1.460	
Per ton of salts	202.7 lbs.		32.7 lbs.	
On the total ash	0.1779 per cent.		1.7841 per cent.	
Per ton of ash	4 lbs.		39.96 lbs.	

The salts contained only a trace of potash, as free alkali, chloride of sodium, and sulphate of lime. Turkey sponge is therefore very rich in iodine, but its value per lb. is unfortunately about twelve times that of iodine. The insoluble ash is principally sand.—Amer. Jour. Phar., Nov. 1884, 583–584; from Phar. Jour. and Trans., Sept. 20, 1884, 233.

Sponge—Use of Bromine for Bleaching.—As is well known, chlorine and its compounds cannot be used for bleaching sponges, as they impart a yellow color to the latter, which in addition become hard and lose their fine texture. The method now generally employed is a water solution of sulphurous acid, and requires from six to eight days, and considerable manipulation. According to the latest researches made in Germany, the bleaching of sponges can be performed more conveniently and expeditiously by means of bromine dissolved in water. As is well known, one part of bromine requires thirty parts of water to dissolve it, and thus a concentrated solution can easily be obtained by dropping a few drops of the former into a bottle of distilled water and shaking it. The sponges are submerged in this solution, and after a lapse of a few hours their brown color changes to a lighter one, the dark-red bromine solution changing at the same time to a light yellow. By treating the sponges to a second immersion of a fresh solution, they acquire the desired light color in a short time. They are improved still more if finally dipped in dilute sulphuric acid and washed with cold water.—Amer. Drug., July 1884, 123; from Scient. Amer.

Cantharides—Determination of Cantharidin.—Emlea Martin determined the amount of cantharidin obtainable from commercial cantharides and powdered cantharides by the method of Procter and Mordreux (chloroform and carbon bisulphide). One specimen in which the soft parts had been destroyed by mites yielded no cantharidin; a second specimen, probably old, left an uncrystallized wax-like substance not further examined; a third specimen attacked by mites, gave .38 per cent. of cantharidin. Five specimens of the powder yielded respectively .25, .30, .48, .49 and 1.06 per cent. of cantharidin; the sample yielding the largest amount, being destitute of green lustrous particles, was most likely made from Chinese blistering beetles.—Amer. Jour. Phar., Nov. 1884, 570.

Beeswax—Examination.—Hübl finds that along with physical examination, F. Becker's saponifying test is of value in the examination of beeswax. According to Becker, 1 gram beeswax requires 97 to 107 mgrms. potassium hydrate for comple saponification, but, according to the author's experience, impure beeswax can be made to give the same number. This difficulty can be overcome by ascertaining not only the total amount of potash required for complete saponification, but also that required to saturate the free acid (cerotic acid) present. Two numbers are thus obtained, which bears the constant relation of 1 : 3.7, as determined in about twenty samples of yellow wax. About 4 grams wax are treated with 20 cc. neutral 95 per cent. alcohol, heated to fusion, and titrated with alcoholic potash solution, phenolphthaleïn being used as indicator. When the first number has been obtained, 20 cc. potash solution are added, and the excess titrated with half normal hydrochloric acid. For the acid in 1 gram wax about 19 to 21 mgrm. KHO are required, and for the saponification 73 to 76 more are required. The proportion varies between 1 : 3.6 and 1 : 3.8, and the total potassium hydroxide used is 92 to 97 mgrm. The author designates the numbers thus obtained as acid number, ether number and saponifying number, respectively. Wax substitutes give very different values for these numbers, as the following average results show:

Substance.	Acid number.	Ether number.	Saponifying number.	Proportion. ether : acid.
Japan wax	20	200	220	10
Carnauba wax	4	75	79	19
Tallow	4	176	180	44
Stearic acid	195	0	195	0÷195
Resin	110	1.6	112	0.015
Neutral substances	0	0	0	0
Paraffin				
Ceresin				
Yellow beeswax	20	75	95	3.75

Hence if the saponifying number falls below 92 with a proper proportion, the wax is adulterated with an inert substance (*i. e.*, paraffin). If the proportion be greater than 3.8, an addition of Japan or Carnauba wax or tallow is probable. If the acid number be low, Japan wax is excluded, and of the remaining two the ether number will determine which has been used. If the proportion be below 3.6, stearic acid or resin has probably been added. It is also clear that the simultaneous presence of an active and an inactive substance may be detected by the figures obtained.—Amer. Jour. Phar., Sept. 1884, 449–480; Dingl. Polyt. Jour. (**249**), 338–342.

Yellow Wax—Conditions Favorable to Bleaching.—Mr. Barnouvin has studied the conditions under which the bleaching of beeswax is effected. Yellow wax, in thin slices, submitted to the action of sunlight and diffused light, was almost bleached in twelve days. When the wax was exposed to sunlight in the daytime and the night air, the bleaching was more complete in the same time. A specimen exposed only to the night air, and sheltered from light in the daytime, was perceptibly less affected than that submitted to the conditions of the first experiment. The conclusions drawn are that light determines the bleaching of wax more rapidly than night air, and that direct sunlight is more active than diffused light; that the action of night air is attributable to ozone, it having been ascertained that the rate of bleaching was in direct proportion to the quantity of ozone present; and that the two actions are complementary, and insure a more rapid result.—Rép. de Phar., Jan. 1885, 6; Phar. Jour. and Trans., Jan. 31, 1885, 616.

Insect White Wax—Production, etc.—Mr. Hosie, who has journeyed through Central Ssu-ch'uan chiefly for the purpose of collecting information on the subject of insect white wax, has made an interesting report to the Director of Kew Gardens. The tree upon which the wax-producing insect is produced is known in different localities under the names of "ch'ung shu" (insect tree), "tung ch'ing shu" (wintergreen or evergreen tree), and "pao kê-tsao" (crackling flea tree). It is probably the

Ligustrum Lucidum (?) of the botanists, but the specimens forwarded to Kew Gardens by the author will decide this point. Although it is found scattered about the whole of Ssu-ch'uan, its chief habitation the valley of Ning-yüan Fu or Chien-ch'ang, in the west of the province. It is an evergreen, with leaves which spring in pairs from the branches. They are thick, dark green, glossy, ovate and pointed. In the end of May or beginning of June the tree bears clusters of small white flowers, which give place to seeds of a dark blue color. In the month of March the author found attached to the bark of the boughs and twigs numerous brown pea-shaped excrescences or galls, in various styles of development. In the earlier stages they looked like minute univalves clinging to the bark. The larger galls were ready detachable, and, when opened, presented either a whitish-brown pulpy mass, or a crowd of minute animals, whose movements are just perceptible to the naked eye. Although the Chien-ch'ang valley is the great insect producing county, the insects may be propagated elsewhere, as in Chien-wei Hsien, in the south of Chiating Fu, and even in the neighborhood of Ch'ungk'ing. These latter insects are, however, declared to be inferior, and fetch a lower price. The galls are in some places packed in loose trays in long bamboo baskets, through which a current of air can freely pass. In Chien-ch'ang, on the other hand, they are made up in paper packets, each weighing about 12 Chinese ounces, and a load usually contains sixty odd packets. At their resting places the carriers open up and spread out the packets in cool places, in order that the heat may not force the insects to escape from the galls during the journey. As it is, a packet on arrival at Chia-ting is usually an ounce lighter than when it leaves Chien-ch'ang.

The Wax Tree, which is known to the Chinese as the "pai-la-chu," or "white wax tree," is cultivated extensively in Chia-ting, more especially within the district of O-mei, Lo-shau, and Chien-wei. The botanical relation of the tree will probably be determined from specimens sent by the author to Kew Gardens. It is usually a stump varying in height from three and four to a dozen feet (average six feet) with numerous sprouts or branches rising from the gnarled top of the stem. The leaves spring in pairs from the branches. They are light green, ovate, pointed, serrated and deciduous. The branches are rarely found more than six feet in length, as those on which the wax is produced are cut from the stems with the wax. The sprouts of one or two years' growth are too pliant, and it is only in the third year, when they are sufficiently strong to resist the wind, that wax insects are placed on them.

The wax insects, which reach the wax-tree districts about the beginning of May, are made into small packets of twenty or thirty galls, which are enclosed in a leaf of the wood-oil tree, whose edges are fastened together with rice straw. The small packets are then suspended close to the branches under which they hang. A few rough holes are made in the leaf by means of a large needle, so that the insects may find their way through them to the branches. On emerging from the galls the insects creep rapidly up the branches to the leaves, where they remain for thirteen days, until their mouths and limbs are strong. During this period they are said to moult, casting off "a hairy garment," which has grown in this short time. They then descend to the tender branches, on the under sides of which they fix themselves by their mouths, and from these spots they are said not to move. Gradually the upper surfaces of the branches are also dotted with insects, which gradually encrust the branches with wax, constructing a series of galleries stretching from the bark to the outer surface of the wax, the appearance of which on the boughs and twigs has been well likened to a coating of sulphate of quinine. This gradually becomes thicker, until, after a period of from ninety to a hundred days, the wax, in good years, has attained a thickness of about a quarter of an inch. When the wax is ready the branches are lopped off, and as much of the wax as possible is removed by hand. This is placed in an iron pot with water, and the wax, rising to the surface at melting point, is skimmed off and placed in round moulds, whence it emerges as the white wax of commerce. The wax which cannot be removed by hand is placed with the twigs in a pot of water, and the same process is gone through, an inferior wax being the result. The insects, which settle to the bottom of the iron pot, are made to yield their last atom of wax by squeezing, and are finally fed to pigs. In good years a packet of Chien-ch'ang insects will produce from three to four catties of wax; in bad years not more than one catty.—Phar. Jour. and Trans., Mar. 14, 1885, 755–756.

Turtle Oil from Seychelles.—This is obtained from the green-back turtle, Chelonia mydas, by boiling the fat. Mr. J. H. Brooks informed Mr. E. M. Holmes that for some twenty years he had used turtle oil with the most beneficial results in all cases where cod liver oil was indicated, and that it is administered in the same doses as the latter. As much as ten gallons of oil are sometimes obtained from a single turtle, and it could be supplied in very large quantities if a demand should arise for it. Its color and non-drying properties render it admirably adapted for pomades, for which an animal oil is generally considered to be preferable to a vegetable one.

Turtle Oil from Jamaica is used in a similar manner, and is prepared from the flesh of the back of the trunk turtle, probably Chelonia Caouana. A sample of oil received by Mr. Holmes was not quite as palatable as the preceding. Both oils are yellowish, and at the ordinary temperature form a thick, finely granular fluid, resembling in consistence partly congealed olive oil.—Am. J. Ph., July 1885, 337. Phar. Jour. and Trans., Jan. 17, 1885, 573.

Cod Liver Oil—Tests for Identity and Purity.—According to A. Kremal, the cod liver oil supplied to the European markets is frequently spurious, being either a mixture of the genuine oil with seal or coalfish oil, or else simply one of the latter oils, alone or mixed. Of late years, Japan has also furnished the market with so-called cod liver oil, the quantity of this in stock in London, in April, 1884, being 500 cases, each containing two tins of 40 to 80 pounds each, and 20 casks, each holding 25 gallons. In order to find, if possible, a test which could be used to ascertain the identity and purity of genuine cod liver oil, Mr. Kremal made extensive experiments with oils of different but known origin. He determined their specific gravity, percentage of liquid and of solid fatty acids, melting points of the solid acid, percentage of free fatty acid, amount of potash necessary for saponification, and amount of iodine solution necessary for iodizing the oil. While some of the results thus obtained appear to be available, in certain particular cases, to distinguish the pure from spurious oils, yet most of the values are so nearly similar that no general method can be based thereon. At the conclusion of his paper, however, the author states that a very good process for distinguishing the pure from the spurious oils may be based upon their behavior towards fuming nitric acid, spec. gr. 1.500. If ten to fifteen drops of the respective oils be poured on watch-glasses, and two or three drops of fuming nitric acid are slowly poured in from the side, the several oils exhibit the following appearance:

1. Genuine cod liver oil (from *Gadus Morrhua*) turns *rea* at the point of contact; when afterwards stirred with a glass rod, it becomes fiery rose-red, soon passing over into pure lemon-yellow.

2. Coalfish oil (from *Gadus Carbonarius*) turns intensely *blue* at the point of contact; when stirred, it turns brown and remains so for two or three hours, when it finally passes likewise into a more or less pure yellow.

3. Japanese cod-liver oil behaves like the preceding, except that red streaks are sometimes observed along with the blue ones, on the addition of nitric acid.

All three varieties likewise yield the well-known color reaction for biliary acids (with sulphuric acid). Two different kinds of cod-liver oil appear to be exported from Japan, since Gehe & Co. report having met with one which did not give this color reaction.

4. Seal oil, treated as above stated, at first shows no change of color, and becomes brown only after some time. As this oil is not a *liver* oil, it of course does not give the reaction for biliary acids.

According to the author, this reaction with fuming nitric acid is so intense and characteristic that admixtures of them (of not less than about twenty-five per cent.) to genuine oil may be readily detected.—Amer. Drug., Nov. 1884, 217; from Pharm. Post, 1884, Nos. 30–31.

Eulachon Oil—Characters, etc.—Dr. A. B. Lyons draws attention to this oil, which has been used medicinally to a considerable extent in British Columbia in lieu of cod liver oil. The bays and estuaries of the Pacific coast of British America and Alaska are annually visited by immense shoals of a small fish popularly known as the candle fish, or adopting the vernacular name, as the eulachon or oulachon. This fish belongs to the family of the salmonidæ, and bears the scientific name Thaleichththys pacificus, (Richardson) Girard. It is nearly allied to the capelin, which it resembles also in its habits. The Indian name is variously spelled eulachon, eulachan, hoolacan, oolachon, oulachon, etc., and is corrupted by the English settler at Victoria into hoolakins.

The oil of the candle fish, as it is sent into the market at present, contains much palmitin and, probably, stearin, so that at common temperatures it is only semi-fluid. The olein, which for medicinal purposes at least must be regarded as eulachon oil, forms a limpid fluid of a pale straw color and fishy odor, unlike that of cod-liver oil, perhaps to many less repulsive. Personally, the author finds it impossible to overcome a natural aversion to any fish oil; those who are less fastidious in their tastes declare that the oil of the candle-fish is positively delicious. Probably most patients would find little to choose between eulachon and cod liver oil. In specific gravity, the eulachon oil differs from any other oil heretofore described. At a temperature of 59° F. (15° C.), water at the same temperature taken as standard, its specific gravity is 0.9071; at 77° F. (25° C.), the apparent sp. gr. is 0.9012, referred to same standard. The specific gravity of cod-liver oil ranges from 0.92 to 0.93, generally being about 0.927 at 59° F. Other fish oils have nearly the same range of specific gravity, and the vegetable oils, which consist chiefly of olein, are only a trifle lighter, sp. gr. 0.915 to 0.920; and the same is true of animal oils, like lard oil, neat's foot oil,. etc., which consist mainly of olein. Shark oil is much lighter (sp. gr. 0.870), and so also is sperm oil (sp. gr. .875 to .883). The author does not know whether shark oil has been subjected to chemical analysis, but from its specific gravity one may infer that it does not consist wholly of olein, and this is known to be the fact in regard to sperm oil. In viscidity there is a notable difference between cod liver oil and the eulachon oil. Under the same conditions of temperature and pressure, 40 parts only of the eulachon oil will flow from an orifice which will discharge 45 or 46 parts of cod-liver oil. Experiments, however, must embrace a larger number of samples than mine have done to be of much value. When mixed with sulphuric acid (5 volumes of oil with 1 of acid) the temperature rose 55° C. (100° F.). With cod liver oil the elevation of temperature is about double this, 112° C. (202° F.). The color reactions with acids are quite different from those of cod liver oil. Mixed with one-third its volume of nitric acid (sp. gr. 1.27), it develops at once a pink color, which fades slowly to amber. After 15 hours' standing the mixture is considerably thickened, and is of a deep amber color, with a reddish cast. Cod-liver oil, treated in the same manner, turned at first pink, faded rapidly to pale amber; after 15 hours the color remained pale amber, and the mixture was more fluid than the former, but with thickened portions partially separated. With Cailletet's test, a mixture of phosphoric acid, sp. gr. 1.44, 12 parts, sulphuric acid, sp. gr. 1.84, 7 parts, nitric acid, sp. gr. 1.37, 10 parts, eulachon oil produces at once a pink color, fading to a shade of brown; at the end of fifteen hours the color of the solution was of a pale reddish brown. Cod-liver oil shows a similar initial coloration under this test, but fades to straw color or amber, if the oil is pure. Sulphuric acid does not produce in eulachon oil the rich purple color which it gives cod liver and other oils containing biliary constituents. It produces instead a deep brown, verging as much toward yellow as toward red. With the elaidin test eulachon oil solidifies rapidly; after 15 hours a small portion only of the oil remains unsolidified—color of the mixture, brown. In the case of cod-liver oil the action is much less rapid; at the end of fifteen hours there remains still a large proportion of fluid, which is of a very dark color, resembling molasses. The oil leaves only a trace of ash when ignited, and the constituents of this probably are unimportant. The oil probably contains, like cod-liver oil, a trace of iodine—the quantity of this element present in the latter is greatly over-stated in the books. It is altogether too minute to be regarded as of any influence, even if the iodine is present, as is believed by some, in the form of an organic compound. All fish oils have been found to contain iodine, and in proportions not much smaller than the cod liver oil itself. A portion of the eulachon oil was saponified, and the soap decomposed. The fatty acids thus obtained amounted to 95.85 per cent. of the oil. As appeared subsequently, however, this is not all fatty acid. The oil was found to contain about 20 per cent. of palmitic and stearic acids, 60 per cent. of oleic acid, and 13 per cent. of an unsaponifiable substance, which is the most peculiar and interesting thing about it. This substance is of an oily consistency at ordinary temperature in summer, has much lower specific gravity than oleic acid, or any other constituent of ordinary fats, sp. gr. .865 to .872 at 59° F., and seems to resemble the unsaponifiable constituent of sperm oil. The author hopes to make this interesting substance the subject of further investigation.—Amer. Jour. Phar., Dec. 1884, 628–632, from Therap. Gaz., Sept. 15, 1884.

True Musk—Export and Character.—The German Consul-General in Shanghai states that the average annual exportation is about 3,000 catties (one catty contains 15 to 20 pods of Yunnan musk, or 20 to 25 pods of Tonquin musk); this requires 60,000 musk deer. He states further that even the best pods do not contain much more than 60 per cent. of true musk, and 30 per cent. will about represent the average.—Amer. Jour. Phar., Jan. 1885, 25, from Schweiz. Woch., xxi, p. 157.

INORGANIC CHEMISTRY.

OXYGEN.

Oxygen and other Gaseous Elements—Solidifying Point.—Mr. Olszewski has succeeded in producing unprecedently low temperature by the vaporization of liquefied oxygen, nitrogen and carbonic oxide under greatly reduced pressure. Upon allowing *liquefied nitrogen* to evaporate with the pressure reduced to 60 mm. of mercury, the liquid commenced to solidify, an opaque layer appearing upon its surface, whilst the hydrogen thermometer, the bulb of which was plunged entirely into the liquid, indicated a temperature of —214°C. The author therefore considers a pressure of 60 mm. and a temperature of —214°C. to be the solidification point of nitrogen, just as a pressure of 35 atmospheres and a temperature of —146°C. is the critical point of the gas. When the pressure of the mercury was reduced below 60 mm., the nitrogen solidified completely into a snow-like mass, and when the rarefaction reached 4 mm. the thermometer indicated —225°C.

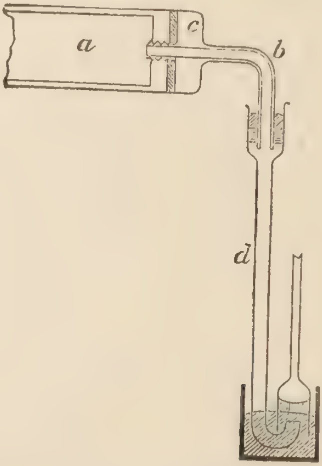
Liquefied Carbonic Oxide commenced to solidify when the pressure was reduced to 100 mm. of mercury, the temperature then indicated being —207°C. A further reduction of pressure lowered the temperature to —211°, when the carbonic oxide had entirely solidified to a snow-like mass, and with the pressure lowered to 4 mm. the thermometer indicated —220.5°C.

Liquefied Oxygen allowed to vaporize under the pressure of one atmosphere produced a temperature of —181.4° C. When the pressure was lowered to 9 mm. of mercury the temperature fell to —211° C., and with a pressure of 4 mm. the thermometer failed to give a correct indication; but notwithstanding that the temperature must have been considerably below —211° C., the oxygen still remained liquid. Mr. Olszewski therefore considers that liquid oxygen will prove to be one of the best refrigerators.—Compt. Rend. c., 350; Phar. Jour. and Trans., Feb. 28, 1885, 696.

Oxygen—Liquefaction by Means of Formene (Marsh Gas).—Cailletet, searching for a body of still lower boiling point than ethylene, which was successfully employed by Wrobleuski and Olszewski, reports that formene or Marsh gas, fulfills all the conditions necessary to at once liquefy oxygen, without the necessity for using apparatus to lower the boiling point. This gas, under slight pressure and cooled in ethylene boiling under ordinary atmospheric pressure, is resolved into an extremely mobile colorless liquid, which in passing into the gaseous condition causes a lowering of the temperature sufficient for the immediate liquefaction of oxygen, which thus becomes one of the simplest of laboratory operations.—Compt. Rend., xcviii., 1565; Phar. Jour. and Trans., Aug. 2, 1884, 81.

Oxygen—Apparatus for the Rapid Preparation of Large Quantities.—Mr. B. Tacke has devised the apparatus, shown by Fig. 56, for preparing large quantities of oxygen at will, and at any rate of delivery. A horizontal wrought-iron tube *a*, one meter long and four centimeters in interior diameter, is carefully closed by welding at one end (not shown in the cut); the other end is narrowed and tapped with a hole of the diameter of 1 centimeter. An iron tube *b*, of ½ centimeter calibre, fits into the thread of the tube, but anteriorly passes through a gas-tight disc *c*, of the diameter of the tube *a*. The latter is charged with 700 to 800 gm. (1½ to 1¾ lbs.) of chlorate of potassium, in such a manner that a channel is left for the passage of the oxygen gas; a lead ring is placed between the head of the tube *a* and the disc *c*, and the tube *b* then screwed into its socket as tight as possible. Both the outer surface of the head of *a* and the face of the disc *c* are provided with concentric rings, into which the ring of lead is forced by pressure, making a gas-tight joint. The tube *b* is bent at right angles with a descending branch of 8 centimeters in length, and is connected by means of a perforated cork with the expanded portion of a glass tube of the internal diameter of ½ centimeter. In order to render the cork gas-tight, a layer of mercury is poured on top of it. The glass tube *d* has the usual length of a barometer, and ends under mercury over a bell-glass, from which the gas is conducted to wherever it is wanted. A little solution of potash is poured on top of the mercury in the bell-glass, for the purpose of washing the gas. The chlorate of potassium is heated by means of a triple Bunsen burner, the heat being applied at first near the closed end. The gas begins to be developed in a short time, and its volume may be easily regulated. A single charge of the tube *a* furnishes about 200 liters (52.8 gallons) of oxygen gas. As soon as enough of oxygen has been evolved to drive all the air (nitrogen, etc.) out of the apparatus (which may be hastened by a previous exhaustion with the vacuum-pump), it furnishes an ever-ready and never-failing source of pure oxygen gas. When the generation of gas is stopped, the mercury in the tube *d* rises a certain distance, and the elevation of the mercury is a sure test of the tightness of apparatus. —Amer. Drug., Feb. 1885, 31; Jour. Ber. d. Deut. Chem. Ges., 1884, 1831.

FIG. 56.

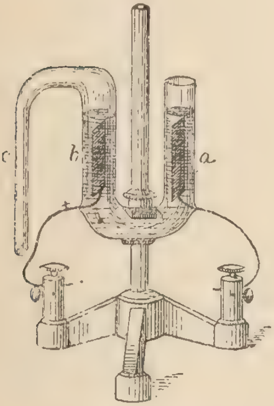


Tacke's Apparatus for Oxygen.

Oxygen—Manufacture from the Air.—The production of oxygen direct from the air has long been aimed at by chemists. It would appear, from a communication made to "La Nature" by Messrs. Brin frères, that this purpose has been successfully accomplished. They have erected a plant which produces 100 cubic metres per day—a quantity which is far beyond merely laboratory experiments. Their process is based on the property possessed by caustic barytes of absorbing oxygen. A series of retorts is fixed in a furnace, and caustic barytes is inserted in each retort. A force-pump and a section-pump are connected with each retort, and, at a temperature of between 500° to 600° C. air is pumped into the retorts. The air has previously been in a chamber containing lime and caustic soda, to free it from carbonic acid gas. At the temperature named the barytes absorbs oxygen. At about 800° the resulting peroxide is deoxidized, and, by means of the suction-pump, the oxygen is drawn off. By this process a perfectly pure gas can be obtained in unlimited quantities. The oxidation and deoxidation of the barytes can be repeated indefinitely. Of course it produces nitrogen as well as oxygen, and the authors believe the manufacture of ammonia by direct combination with hydrogen will be possible. The applications of oxygen are likely to be very numerous. The authors think it will be found superior to carbonic acid gas in aërated beverages. For all antiseptic purposes oxygen is of great value, and it is likely to be extensively employed in metallurgical processes, as in its medium elevated temperatures are more readily obtained than in the atmosphere.—Amer. Drug., Feb. 1885, 36; from Chem. and Drugg.

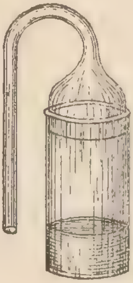
Ozone—Apparatus for Generation.—Mr. G. Krebs recommends that apparatus for generating ozone should always be constructed of glass exclusively, and he describes the following, suitable for the different methods of generation:

FIG. 57.



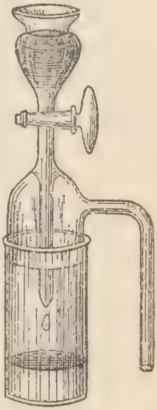
Ozone from Water.

FIG. 58.



Ozone from Permanganate.

FIG. 59.



Ozone from Barium Binoxide.

Fig. 57 shows an apparatus for generating ozone by the electrolysis of water. To the closed end of the leg *b* of a U-tube *ab*, which may be raised and lowered on the stand, a glass tube *c* is fused which is made to dip into a short test-tube. The platinum strip in *b* is connected with the positive pole of a battery of at least three good Bunsen cells. Through *a*, enough diluted sulphuric acid (very cold) is poured to make the level of the contents a little higher than the platinum strips. After a few minutes, the decomposition of water will have continued long enough to plainly show the presence of ozone by iodide of potassium and starch.

Fig. 58 shows another apparatus in which permanganate of potassium and sulphuric acid are used. It is a glass cylinder, the bottom of which is of the same thickness as the sides. The cylinder is closed with a high, thin-walled, ground glass cap to which a curved delivery tube is attached. Sulphuric acid is next poured into the apparatus to the height of one or two centimeters, and upon it is sprinkled a small quantity of dry permanganate of potassium, at most two parts for every one part of the acid. If too much of the salt is used, or if the salt is first introduced and the acid poured on it, a violent explosion may take place shortly afterwards. If performed as above stated, no accident ever occurs.

Fig. 59 represents an apparatus in which binoxide of barium is employed in connection with sulphuric acid. Either the ordinary binoxide may be used or, better, the hydrated binoxide, such as is produced by dissolving the common binoxide in diluted hydrochloric acid, precipitating by means of baryta water, and drying. The cylinder is charged with a layer of binoxide, about 2 cm. in depth, and the hollow funnel attachment then adjusted. The latter has a funnel fused into it, and this is filled with concentrated sulphuric acid, which is allowed slowly to flow upon the barium oxide. These forms of apparatus can be bought of Desaga, in Heidelberg.—Amer. Drug., Nov. 1884, 207, from Wied. Ann., 22, 139.

HYDROGEN.

Hydrogen—Generation for Marsh's Test.—Dr. L. Wolff recommends the method first proposed by Otis Johnson for the generation of hydrogen in Marsh's apparatus. The method is dependent on the action of metallic aluminium upon solution of potassium hydroxide, and, furnishing hydrogen readily and rapidly that is absolutely free from arsenic, should be used by preference to all others. Moreover, it is not much more expensive than other methods, since large quantities of hydrogen are given off by the use of comparatively small quantities of the metal. Numerous experiments made by the author prompt him to recommend Marsh's method, when hydrogen is generated as above, as by far the most satisfactory and reliable of any methods that have hitherto been proposed.—Pharm. Rundschau, June 1885, 126.

Potable Water—Examination.—Dr. F. Hoffman makes some general remarks respecting the conditions that make water suitable or unfit for drinking, and communicates the method recommended by Dr. Geisler as most suitable for the use of apothecaries engaged in such examinations.—See Pharm. Rundschau, Febr. 1885, 29–30.

Distilled Water—Contamination with Nitrous Acid.—Mr. T. P. Blunt observed the presence of nitrous acid in distilled water carefully made in the usual manner. Along with the nitrous acid, ammonia was found in unusual quantity, and the acid was probably present in part at least in the form of ammonium nitrite. Since making this observation, the author is in the habit of adding to the still-charge a slight excess both of sulphuric acid and permanganate of potassium, and thus secures a distilled water of exceptional purity, giving no reaction either with Nessler's test or starch and iodide solution.—Phar. Jour. and Trans., April 11, 1885, 829.

Peroxide of Hydrogen—Effect as a Peptonizing Agent.—See *Peptonization* under "Organic Chemistry."

Hydrosulphuric Acid—Preparation in a Condition Absolutely Free from Arsenic.—Hydrosulphuric acid gas free from arsenic could be hitherto prepared only by starting from materials free from arsenic, while no method was known to deprive arsenical hydrosulphuric acid gas from the contamination. As suitable sources, free from arsenic, the following were usually recommended: sulphide of calcium and sulphide of barium, which have the additional advantage that they eliminate no hydrogen in addition to sulphydric acid, liquid sulphydrates of barium, calcium, or magnesium, artificial (pure) sulphide of iron, sulphide of zinc, etc., etc. All these substances are not so easy to obtain as the ordinary crude sulphide of iron of commerce, and besides, it is not by any means easy to procure a hydrochloric acid free from arsenic. It will therefore be of great importance to possess a method of preparing absolutely non arsenical hydrosulphuric acid gas, even from contaminated materials. This may be accomplished, according to Otto v. d. Pfordten, by passing the hydrosulphuric acid gas over sulphide of potassium, the ordinary officinal liver of sulphur, which completely retains any accompanying traces of arseniuretted hydrogen.

For this purpose, the generated gas is first made to pass through a wash-bottle, and then through a chloride of calcium apparatus to dry it. It then enters a difficultly fusible glass tube, passing through a sheet-iron box of about 30 cm. in length, and 10 cm. in height and depth, under which is placed a gas-flame, and which acts as a hot-air bath for the tube, which must be kept at a temperature of 350° to 360° C. The tube is filled with pieces of sulphide of potassium, which, though it melts somewhat at the above-named temperature, yet retains its shape and consistence, so that there is no danger of the tube being stopped up. If the operation is to be frequently repeated, and the control of the proper temperature by means of the hot-air bath too circumstantial, the tube may be heated by keeping it immersed in melted lead. The gas passing from the tube is passed through a solution containing carbonate of sodium, and is then completely pure and fit for use. It no longer contains even a trace of arsenic. The author thinks that the arsenic is withdrawn from the gas probably according to the following reaction:

$$\underset{\substack{\text{arseniuretted}\\\text{hydrogen.}}}{2AsH_3} + \underset{\substack{\text{sulphide}\\\text{potassium.}}}{3K_2S_3} = \underset{\substack{\text{sulpharsen}\\\text{ite potassium.}}}{2AsS_3K_3} + \underset{\substack{\text{hydrosul-}\\\text{phuric acid.}}}{3H_2S}$$

—Amer. Drug., June, 1885, 110, from. Ber. Deutsch. Chem. Ges.

Hydrosulphuric Acid—Preparation from Sulphide of Magnesium.—Dr. Gerhard finds the method of obtaining sulphuretted hydrogen by simply heating hydrosulphide of magnesium, to yield a very pure article, which is, moreover, absolutely free from arsenic. The preparation of the hydrosulphide, as ordinarily conducted, is, however, quite troublesome, and he, therefore, recommends its preparation, in form of solution, by decomposing the solution of an alkaline sulphide or hydrosulphide by means of sulphate or chloride of magnesium. The solution so obtained will yield pure sulphydric acid by simply heating it.—Arch. d. Phar., May 1885, 384–386.

NITROGEN.

Nitrogen—New Method of Determination.—Of the various modern methods proposed for the determination of nitrogen, only that of Kjeldahl has been able to compete with and to excel in accuracy the old method of Will-Varrentrap. The new process yields not only more accurate results, but is more simple, consumes less time, and is applicable to liquids or solids. Besides, as the acid used in the reaction does not appear colored at the end, the process may be conducted even at night time. The following is a description of the method:

1.5 gm. of the substance, which must not contain over 10 per cent. of nitrogen, is put into a flask of a capacity of 100 to 150 cc., with a rather wide and short neck, and 20 cc. of a mixture added, consisting of 16 cc. of concentrated and 5 cc. of fuming sulphuric acid. Afterwards, 2 gm. of anhydrous phosphoric acid are added, and the flask heated on a sand-bath, at first gently, then more strongly, and finally at a temperature at which the acids boil. During the commencement of heating, and as long as any sulphurous acid vapor is given off, the flask must be inclined sideways, so that the spirtings may strike the side of the flask and flow back.

After a certain time, which is about 30 minutes for sulphate of ammonium, 1 hour for guano, 2 to 4 hours for albuminoids, 5 hours for blood, etc., the contents assume a light color, and the largest portion of the nitrogenized substances is converted into sulphate of ammonium. The still remaining undecomposed portion is then also converted into sulphate of ammonium by adding successive small portions of powdered permanganate of potassium to the hot contents of the flask previously taken from the fire. When the liquid assumes a green color, the operation is terminated.

The contents are now allowed to become cold, then washed into another flask of the capacity of 500–600 cc., with very short neck, and diluted so as to measure not more than 300 cc. Next 3 to 5 gm. of granulated zinc are put in, to prevent bumping, an excess of solution of soda is added, and the flask rapidly connected with a cooler, care being taken that none of the contents of the flask can be squirted over into the tube of the cooler. A half hour's boiling, with full flame, is sufficient to drive all the ammonia into the receiver (best, an Erlenmeyer flask) previously connected with the cooler, and charged with standard hydrochloric or sulphuric acid.

With proper arrangement, one person may make 24 to 36 determinations in one day, with this process.—Amer. Drug., Nov. 1884, 209; from Pharm. Centralh. and Ph. Post.

Nitrous Oxide—Care in its Preparation.—Mr. Cazeneuve discusses some difficulties met with in the preparation of nitrous oxide for anæsthetic purposes. The points investigated are the circumstances that sometimes determine explosions during the preparation of the gas; the cause of the irritating odor and liability to produce symptoms of asphyxia observed in freshly-prepared nitrous oxide, which properties become modified after the gas has been kept about twenty-four hours in a gasometer; and the apparent gradual loss of anæsthetic properties suffered by the gas when kept for a long time over water. The explosions during preparation the author attributes entirely to over-heating. He points out that sometimes the nitrate is introduced into the retort without the precaution of previous drying. In such a case he thinks that adherent moisture and the water of crystallization given off when the salt melts condense in the upper part of the retort, and running back, so lower the temperature as to retard the evolution of the gas. The operator is thereby induced to raise the temperature, so that when the point is reached at which all the water has passed over, there is danger that the high temperature, unless modified, coming into play will cause an explosive decomposition of the remaining salt. He, therefore, recommends the use of a dried salt, and only a gentle heat. The irritating constituent, in freshly-prepared gas, the author considers to be a contamination of hyponitrous acid that escaped the washing, but which can be removed by shaking with ferrous sulphate solution. A stay of twenty-fours in the gasometer exercises a similar purifying action, and he, therefore, recommends that the gas should always be prepared some little time before it is required for use. The gradual decrease in anæsthetic properties is explained by the presence in the gas of nitrogen and oxygen, derived from the decomposition of the nitrate. The proportion at first is not sufficiently high to affect the anæsthetic action; but as the nitrous oxide dissolves in the water according to its coefficient of solubility, which is relatively higher than that of nitrogen or oxygen, the relative proportion of the foreign gases to the undissolved nitrous oxide is to that extent increased. Mr. Cazeneuve states that he has examined some commercial specimens of liquefied nitrous oxide, and found them practically chemically pure.—Jour. de Phar. et Chim. (5) vi, 6; Phar. Jour. and Trans., Jan. 31, 1885, 615.

Nitrous Acid—New and Delicate Reagent.—Mr. Raphael Meldola has found a dilute solution of a derivative of "para-nitraniline," namely *para-amido-benzol-azodimethyl-aniline* (which see under "Organic Chemistry") to furnish a delicate reagent for nitrous acid. The reagent is prepared by dissolving 0.5 gm. of the substance in 1 litre (of water? Rep). A few drops of this deep red solution are added to the liquid to be tested for nitrous acid, and immediately afterwards a few drops of hydrochloric acid. Ammonia is then added in drops, and the liquid stirred after each addition until the blue color appears. The ammonia precipitates the base, and the latter is converted by even traces of nitrous acid into a tetra-azo salt, which is the agent that causes the blue color on exposure to air.

This reagent is able to reveal nitrous acid even in very dilute solution, the limit appearing to be 1 part (of sodium nitrite) in 6,400 parts of water. It has this advantage over metadiamidobenzol (or rather metaphenyl diamine), formerly used as a color-test, that its solution may be kept unaltered for any time, while the last-named reagent was exceedingly prone to become colored by contact with the least trace of nitrous acid. The blue color produced in the reaction is not stable, and disappears slowly on exposure to air.—Amer. Drug., June 1885, 112; from Ber. d. Deutsch. Ch. Ges., vol. 17, 256.

Nitrous and Nitric Acid—Detection by Means of Carbolic Acid.—Dr. H. Hager recommends carbolic acid as a convenient reagent for nitrous and nitric acids, and their compounds in colorless liquids. Two or three cc. of the liquid are made strongly acid with hydrochloric acid, some crystals of carbolic acid are then added, and the mixture is heated to 80° or 90° C. In the absence of nitrogen acids, the liquid remains colorless or becomes very slightly colored. If traces of either of the above acids are present, however, the liquid at once becomes dark and strongly colored. When a crystal of carbolic acid is thrown into pure concentrated sulphuric acid, it at first swims on the surface and then passes into solution without coloring the liquid. But if the sulphuric acid contains a trace of nitric or nitrous acid, a coloration is produced, which is red, brown or green, according to the proportion of the contamination. If the sulphuric acid contain water, heating to 50° or 70° C. is necessary.—Pharm. Jour. and Trans., Aug. 2, 1884, 83; Pharm. Centralh., 1884, 289.

Nitrous Acid—Naphthylamine Test.—Mr. R. Warington records some experiments upon the value of the "naphthylamine test," to which Dr. Griess had originally called attention, as one of extreme delicacy for the detection of nitrous acid. The liquid to be tested is treated first with sulphanilic acid, then acidified, and a solution of hydrochloride or sulphate of naphthylamine added. If much nitrite is present, a deep ruby color is produced, the solution quickly becoming turbid by precipitation of the coloring matter; if only a trace of nitrite is present, the color will be pale pink. Like the reaction previously described, the chemical changes consist of two stages; but as both of these will proceed side by side in an acidified solution, there is no advantage in postponing the addition of the naphthylamine. The reaction is not apparently facilitated by heat. Working in narrow test-tubes, and adding one drop of a saturated solution of sulphanilic acid, one drop of dilute hydrochloric acid, and one drop of a saturated solution of naphthylamine hydrochloride, the following results were obtained:

With a solution containing 1 part of nitrogen as nitrite in 1 million of water, an immediate pink color was produced, rapidly deepening to a dark ruby tint.

With a solution containing 1 part in 10 millions, a pink tinge was almost immediately produced, deepening gradually to a full rose color.

With a solution containing 1 part in 100 millions, a pink tinge first became perceptible at the end of six minutes; at the end of an hour, the solution was of a distinct pale pink color.

With a solution containing 1 part in 500 millions, no reaction was obtained for an hour or two, but a faint pink tinge was finally developed. In a large volume of solution, a distinct pink tinge was obtained with a dilution of 1 in 1,000 millions; but this color was barely perceptible in a three-inch column, unless a test-tube containing pure water was placed by the side for comparison.

The naphthylamine reaction thus exceeds all others in delicacy. The color produced has the additional advantage of being permanent.—Amer. Drug., June 1885, 113; from Chem. News, Jan. 23, 1885.

Nitrous Acid.—Occurrence as a contaminant of *distilled water*, which see under "Pharmacy," and p. 211.

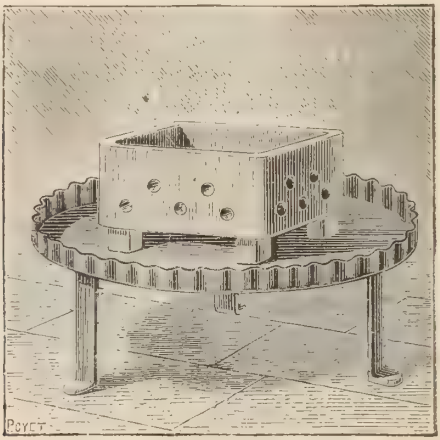
Free Nitric Acid—Volumetric Determination.—Prof. A. Longi recommends the use of a volumetric solution prepared by dissolving 40 gm. of sulphate of tin and potassium in 800 gm. of diluted sulphuric acid (1 part of acid and 1 part of water), with addition of a little concentrated hydrochloric acid. This solution is standardized by means of ferric chloride and permanganate, and mixed with more diluted sulphuric acid, so that the final solution may contain 11.8 gm. of tin per litre. This constitutes a decinormal solution.

The liquid containing the free nitric acid is colored blue by a drop of solution of diphenylamine in sulphuric acid, and then titrated with the above test solution, from a burette divided into $\frac{1}{10}$ cc., until the solution is colorless.—Amer. Drug., Aug. 1884, 155; from Gazz. Chim. Ital., 13, 482.

Nitric Acid—Delicate Test.—Prof. Uffelmann recommends the following: Add to a small piece of diphenylamine, of about the size of half a lentil, placed in a porcelain capsule, 1.5 cc. H_2SO_4, which must be absolutely free from NO_2 and HNO_3; stir with a glass rod until a very pale pink color is produced, then add 3 or 4 drops of the liquid to be tested, on the border of the capsule. Much HNO_3 will instantaneously cause the appearance of a bluish line, extending like a cloud. Slight traces of HNO_3 give that line, after a short while, mostly within a minute, and this line also extends and becomes more intense. The proportions given are essential to success; the test is more delicate than that with brucine.—Amer. Jour. Pharm., April 1885, 173; Pharm. Ztg., No. 14.

Nitrates—Detection by Means of Cinchonamine.—Messrs. Arnaud and Padé find that the nitrate of cinchonamine (the new alkaloid discovered by them in cuprea bark) crystallizes with extreme facility, and is almost completely insoluble in acidulated water. They propose this property as a test for the presence of nitrates, the hydrochlorate of the alkaloid being the most suitable for this purpose. The crystals of nitrate of cinchonamine produced are well defined and easily recognizable. In the presence of hydriodides, it is necessary to eliminate the hydriodic acid, since the hydriodide of cinchonamine is but slightly soluble in water. For this purpose the addition of a slight excess of solution of acetate of silver is best.—Pharm. Jour. and Trans., Aug. 2, 1884, 83; Comptes Rend., xcviii., 1488.

FIG. 60.



Pasteur's Sulphur Burner.

SULPHUR.

Sulphur—Apparatus for its Combustion.—Mr. Pasteur has suggested for purposes of disinfection a very simple and effective apparatus for the combustion of sulphur, which is shown by Fig. 60. It consists of a rectangular vessel of fire-clay twenty centimeters wide and twenty-five centimeters long, the sides of which are perforated, in the manner shown in the illustration. This rests upon an iron pan with feet, which supports it at a safe distance from the floor, and for further security a layer of sand may be interposed between the furnace and the pan. In order to obtain complete combustion of the flowers of sulphur, care should be used to secure equal combustion over the entire surface. This may be accomplished by first moistening its surface with alcohol, which when lighted will ignite the sulphur.—Amer. Drug., Mar. 1885, 69; from La Nature.

Sulphide of Sodium—Preparation.—According to Mr. A. Damoiseau, the best yield of sulphide of sodium is obtained when 45 parts of soda in solution are saturated with sulphuretted hydrogen, the solution being allowed to become warm; a solution of 55 parts of caustic soda is then added, and the whole allowed to crystallize.—Amer. Drug., June 1885, from Pharm. Jour.

Sulphuretted Lime—Product Obtained by Different Processes.—Mr. T. S. Dymond has experimented with a view to determine which of the processes that have been hitherto employed for the production of sulphuretted lime is the best. (1) By heating 100 parts of lime in fine powder, with 90 parts of precipitated sulphur in an earthen crucible, with lid luted on, under proper precautions, a brown product containing 30 per cent. of sulphide of calcium is obtained. (2) By passing sulphuretted hydrogen through dry slacked lime for eighteen hours, the product, which was light green, contained 5.7 per cent. of sulphide of calcium. (3) By passing sulphuretted hydrogen through pasty slacked lime for eighteen hours, a dark green product was obtained, which contained 6 per cent of sulphide of calcium. (4) By heating 7 parts of finely powdered sulphate of calcium and 1 part of finely powdered wood charcoal, intimately mixed, in an earthen crucible to a red heat until the black color had disappeared, a product of a light pink color was obtained, which contained 58 per cent. of sulphide of calcium. The last process is therefore to be preferred, not alone because it gives the better products, but also because it is less circumstantial than any of the others.—Yearbook of Pharm., 1884, 573–575.

Sulphurous Acid—Strength of Aqueous Solutions.—The last U. S. Pharm., requiring an aqueous sulphurous acid of only about half the strength (4%) of that required by the Pharm. of 1870, and some doubt having arisen about what the revisers had in view when making the change, and several criticisms of the alteration having appeared in public, Mr. Carl Riebe investigated the subject, and reported the results at the last meeting of the Michigan Pharm. Association. At the close of his paper he sums up his results as follows:

1. Water will not, at a medium temperature (of about 17.5° C. equal 63° to 64° F.) retain more than 9 per cent. of sulphurous acid gas.

2. The solution can be brought to the strength of 8 per cent. by following the process of the U. S. Ph. of 1870, but it will after a short time come down to 7 per cent.

3. The strength best suited for pharmaceutical and technical purposes is 6.5 per cent., or sp. gr. 1.034, since it will keep for a long time by following the directions laid down in the Pharm. of 1870, for preservation, and can be shipped without any risk of loss.

4. Sulphuric acid will always be present, though in so small an amount that it will not interfere with the medicinal value of the preparation. By adding some barium sulphite, and macerating for a day or two, the sulphuric acid of an old sample can be removed.—Amer. Drug., Feb. 1885, 37; from the Druggist.

Sulphurous Acid—Titration.—Formerly it was assumed that an aqueous solution of sulphurous acid could be titrated with litmus exactly as the strong mineral acids are; that is, that the change of color takes place when two molecules of sodium hydroxide have been added to one molecule sulphurous acid. This, however, is not the case, as $NaHSO_3$ is neutral to litmus. Litmus has been recently replaced in many cases by methyl-orange, which presents greater advantages for titrating carbonates or sulphites. The orange cannot, however, be employed with organic acids.

Thomson's experiments (Chem. News, **47**, 136) having brought forward the important fact that the salts of sulphurous acid present have different kinds of neutrality towards indicators, Mr. G. Lunge repeated his experiments in order to confirm Thomson's results. In the course of this investigation, the author made a series of interesting experiments on the titration of bisulphites, and of free sulphurous acid. He concludes that litmus and phenacetolin should be entirely rejected for the titration of sulphurous acid, for totally different results are obtained according as the change of color is taken at a decided blue or a decided red. Methyl-orange, phenolphthaleïn and rosolic acid, on the contrary, are all equally well serviceable; in the case of the orange, however, it must be noted that one molecule SO_2 is saturated by one molecule KHO, and, in the case of phenolphthaleïn and rosolic acid, by only half a molecule, *i. e.*, one equivalent of SO_2 to one of KHO. A further confirmation of these results was obtained by some experiments with sulphites.

The novelty of the author's experiments is the abnormal behavior of litmus and phenolphthaleïn.—Amer. Drug., Feb. 1885, 36, from Dingl. Pol. J. and J. Chem. Soc.

Bisulphites—Action upon Chlorates.—See under "Chlorine."

Mono hydrated Sulphuric Acid—Specific Gravity.—Some time in 1883, Lunge and Næf published the results of some of their investigations, in which they give the specific gravity of pure sulphuric acid as 1.8384 at $\substack{15^\circ \\ 4^\circ}$ in vacuo. This figure differs so much from those of other observers (three of whom differ only by the allowable variations of 0.0002, namely Marignac 1.8372, Kohlrausch 1.8373, Schertel 1.8371) that Prof. D. Mendelejew determined to re-investigate the subject, and to ascertain the probable causes of the error in Lunge's and Næf's determinations. Without dilating on the latter subject, which is uninteresting to any except those specially engaged in similar researches, we will merely state that Mendelejew finds the figure 1.8371 at $\substack{15^\circ \\ 4^\circ}$ in vacuo as being nearest to the true specific gravity of pure mono-hydrated sulphuric acid.—Amer. Drug., Jan. 1885, 16; from Ber. d. Deutsch. Chem. Ges., 1884, 2,536.

Sulphuric Acid—Substitution of Native Pyrites for Sicilian Sulphur by American Manufacturers.—Up to a few years ago, all the sulphuric acid produced in the United States was made from Sicilian sulphur. The attempts which were occasionally made to utilize the domestic native sulphides (pyrites) were in no case permanently successful, since the manufacturers did not use either the proper methods or apparatus. Prof. G. Lunge had drawn attention to this fact already in the German edition of his Handbuch der Soda-Industrie, and in the subsequent English edition he stated that it was only a question of time when pyrites would take the place of Sicilian sulphur in the United States.

This prediction has been already partly fulfilled, and it is said to be chiefly due to the detailed description of the most practical and economical methods used by England and other nations for working pyrites, which Prof. Lunge describes at length in his elaborate work. In June, 1882, only two sulphuric acid works used pyrites, but in March, 1884, the number had already increased to eighteen.

With a desire to correct some erroneous statements made by him in reference to a misunderstood or misconstrued circular which had reached him from the United States, Prof. Lunge takes the opportunity of announcing that many American pyrites ores (as, for instance, that of the Davis Company, of Charlemont, Mass.) are absolutely *free from arsenic*, and that therefore an acid prepared from such pyrites is able to compete even more favorably with sulphur-made acid than is the case in Europe, where pyrites is almost always contaminated with arsenic.

Another pyrites free from arsenic is that offered by the Sulphur Mines Company, of Virginia.—Amer. Drug., Nov. 1884, 216; from Dingler's Journ.

Sulphuric Acid—Contamination with Mercury.—Mr. M. Miropoljsky observes that commercial sulphuric acid, both the common and the fuming, often contains traces of mercury which cannot be removed by redistillation. The quantity of the metal is, however, so small that it cannot be discovered by the usual reagents. Its presence may be established by diluting the acid with ten to fifteen times its weight of water, and suspending in it a golden needle as the negative pole of a galvanic battery. After the current has passed a sufficient time, the needle is removed, washed with water and alcohol, then dried in an exsiccator, and finally heated in a glass tube closed at one end, and of which the other end is drawn out to a capillary diameter. On heating the needle, the mercury condenses in the capillary tube in microscopic droplets.—Amer. Drug., June 1885, 112, from Chem. Ztg.

Mineral Acids—Solid form Suitable for Transportation.—The danger which is connected with the carrying of liquid mineral acids to any distance, and the high freight expense it involves, have induced Dr. H. Grüneberg to look for a method of putting these acids in solid form, so as to make them more easily transportable, and to do away altogether with the risk of the danger of breakage. Thus English sulphuric acid used by the petroleum refineries of Roumania, was advantageously replaced by solid anhydride. It was also tried to make liquid acids to be absorbed by porous indifferent bodies. "Kieselguhr" (infusorial earth), which is found in almost inexhaustible quantities in Lüneburg, was found to be the substance most adapted to absorb and retain mineral acids in quantities relatively considerable. After being deprived, by drying, of about fifteen per cent. of moisture which it contains on the average, kieselguhr can absorb from three to four times its weight of sulphuric acid at 66° B, and twice its weight of muriatic acid at 20° and nitric acid at 36°. No difficulty is found in the operation. The silicious earth is dried and pressed through sieves, then taken into a shallow wood, iron, or stone vessel, and the acid is added in a thin stream. The mixture is well agitated, and the lumps which at first form are broken up. The apparatus now used for the manufacture of superphosphates can be used for this process. The obtained product may be sifted. The sulphuric acid thus changed into solid form attracts moisture very quickly, and has to be therefore packed at once. For packing, lead-lined sheet iron vessels can also be used, which are covered internally with a layer of gum lac.

Sulphuric acid solidified as above can find application in the form of a dry powder in several branches of industry, such as the refining of petroleum or of the fat oils, in the manufacture of dynamite, in stearine works, in the manufacture of carbonic acid for aerated waters (it is exported in large quantities to India for this purpose), in the manufacture of superphosphates, and of sulphate of ammonia, etc. In these cases the acid powder is put into direct contact with the substance to be treated, such as raw petroleum, glycerin, powdered phosphate, carbonate of lime, etc., and is then diluted by the addition of water to the degree of concentration required for the operation. In those cases in which only the acid in the liquid state can be employed, such as for metal, ores, etc., the acid can be previously liquefied by being placed together with water in lead-lined tanks, the remaining powder being then separated from the liquid by means of filter presses.

The high cost of transportation of the liquid acids may render the application of this solidified product convenient in far distant countries. —Amer. Drug., Mar. 1885, 49; from Scien. Am. Suppl.

Free Mineral Acids—Detection in Vinegar and Wines.—J. J. Bergman takes advantage of the fact that oxalate of calcium is insoluble in acetic and tartaric acids, but soluble in mineral acids. Take 5 cc. of the liquid to be examined, and 5 drops test-solution of oxalate of ammonium, and then 10 drops test-solution of sulphate of calcium. (The addition of the lime solution is not necessary with wines, which generally contain sufficient lime.) In the absence of free mineral acids, a precipitate of oxalate of calcium will occur (either at once or after a while); if, however, mineral acids be present, the liquid will remain clear. After repeated experiments it was found that as little as one-half of 1 per cent. of free sulphuric, nitric, and muriatic acids could be detected.—Amer. Jour. Phar., Nov. 1884, 574; from Farm. Tidskrift.

CHLORINE.

Euchlorine—Value as a Disinfectant.—Mr. T. Hatfield Walker observes, in reference to the value of *euchlorine* as a dlsinfectant, that each molecule sets free four atoms of oxygen in the nascent condition, and is probably the most powerful of its class. The free chlorine that it contains, doubtless, also contributes to its efficacy. Euchlorine is a mixture of free chlorine, or chlorine very loosely combined with chlorous oxide, and is prepared by pouring strong hydrochloric acid on potassium chlorate and applying a gentle heat. He placed a small basin containing the chlorate in a large one full of boiling water, and on pouring in the hydrochloric acid the euchlorine was freely given off. The practical experience of several years' use in all cases of fever fully bore out the theoretical experiments, that in euchlorine we have a cheap, simple and effective disinfectant.—Amer. Jour. Pharm., April 1885, 182; Quarterly Therap. Review, Jan. 1885.

Chlorates—New Test in Presence of Chlorides and Nitrates.—Mr. Fourmont has based a new test for detecting chlorates upon the fact that a green color is produced when sulphuric acid is poured upon copper in the presence of the above salt. If a nitrate, in place of chlorate, is present, nitrous acid fumes are given off, and the solution acquires a blue color from the presence of sulphate of copper.

a. Chlorate alone present. If this salt be treated with sulphuric acid and copper, hydrochloric acid is eliminated, and chloride of copper goes into solution, which acquires a green color.

Before applying the test, it is, of course, necessary to insure the absence of salts which precipitate silver (such as chlorides, etc.).

b. Chlorates and Nitrates present. The same reaction takes place at first, namely, hydrochloric acid is first eliminated, and a green solution results. But soon afterwards reddish fumes of nitrous acid, etc., are given off, and the solution turns blue. Two minutes suffice to complete the reaction.

c. Chlorates and Chlorides present. The chloride having first been found by means of nitrate of silver, the above reaction may be performed at once, even without first separating the chloride of silver by filtration.

d. Chlorates, Chlorides and Nitrates present.—On adding the copper and sulphuric acid, all three salts are decomposed, and hypochloric, hydrochloric and nitric acid are at the same time disengaged. The last two acids together produce aqua regia, which, with the copper, produces only chloride, coloring the solution green. If a hydrochloric acid (or a chloride) has been previously found, the mixture contains both a chloride and a chlorate. On heating now for one or two minutes, the green color disappears and a blue one takes its place. Hence we may conclude that all three salts have been present. Yet the presence of a chloride and a nitrate alone (without a chlorate) may produce the same reaction in the end. For this reason it is safer to remove the chloride first by nitrate of silver, and then to test for the other two salts.—Amer. Drug., Nov. 1884, 209, from Journ. de Pharm. x. (5), (1884,) 96.

Chlorates—Action of Bisulphites.—Mr. Prudhomme observes that on treating sulphurous anhydride with chloric acid, sulphuric and hydrochloric acids are formed. The bisulphites of the alkalies, however, reduce the chlorates only in a very imperfect manner, as is shown by the following equation: $NaClO_3 + NaHSO_3 = HClO_2 + Na_2SO_4$ and $NaClO_3 + 2NaHSO_3 = HClO + Na_2SO_4 + NaHSO_3$. The resulting hydrogen sodium sulphate may be made to react with further portions of bisulphite, sulphurous acid being disengaged. On adding a solution of sodium bisulphite to a concentrated solution of sodium chlorate (100 grammes per litre), a violent action occurs, especially if the solution of chlorate is hot. A strong odor of chlorine oxides and of sulphurous acid is given off, and the solution will be found to destroy the color of indigo and other dye stuffs, and convert cellulose into hydroxycellulose. With salts of aniline the solution forms aniline-black, a reaction which confirms Rosenstiehl's theory as to the formation of aniline black. When chlorates and bisulphites act on one another in the presence of alcohol, chlorinated ethers are formed.—Amer. Drug., June 1885, 111, from Dingl. Polyt. Jour.

Chlorate of Potassium—New Process of Preparation.—Messrs. E. K. Muspratt and G. Eschellmann are the inventors of a new process for preparing chlorate of potassium, which is given as follows: Chlorine gas is conducted through milk of magnesia, and the resulting solution evaporated to 35°–30° B., until a portion of the chloride of magnesium begins to crystallize out. This concentrated solution is now mixed with chloride of potassium (obtained from the Stassfurt potash mines), and the resulting products are chlorate of potassium and chloride of magnesium. The larger portion of the chlorate of potassium crystallizes out. The remaining mother-liquid contains only 5 to 10 per cent. of the total quantity of the chlorate, which it does not pay to extract. It is then further treated with hydrochloric acid and steam, whereby the chlorate is made to give off chlorine gas, which is absorbed by magnesia or lime. The residue, containing an excess of hydrochloric acid, is neutralized with carbonate of magnesium, and consists now of a solution of chloride of magnesium contaminated with a little chloride of potassium. It is evaporated to 45° B., allowed to cool, and to become solid. This solidified magnesium chloride may either be sold as such, or may be reconverted into magnesia by driving off the chlorine with heat, when the magnesia may be again used in the next operation.—Amer. Drug., June 1885, 107.

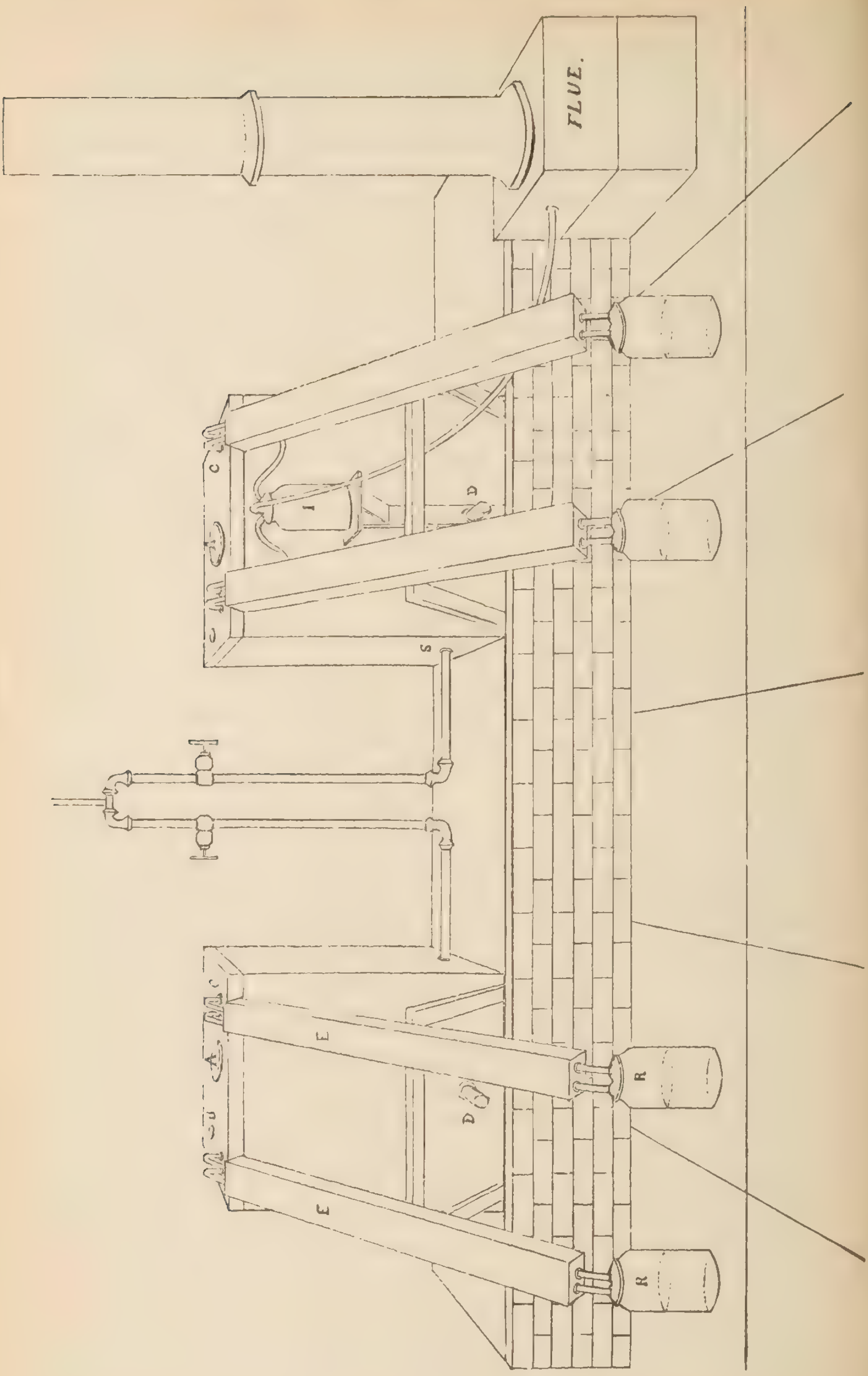
BROMINE.

Bromine—Manufacture at Pomeroy, Ohio.—Mr. Charles C. Seebohm gives the following description of the manufacture of bromine from the bittern of the Excelsior and Buckeye Salt Works, of Mason City, W. Va. The bromine shop, which is a small wooden structure, contains two wooden storage tanks, into which the bittern flows directly from the salt works through wooden pipes. After the bittern enters the shop it is allowed to cool, after which it is passed into the purifier. From the purifier it enters the furnace, where it is heated preparatory to passing into the stills, which are two in number. These stills are rude stone chambers hewn out of blocks of our native sandstone. Each is about six by eight feet in size, the tops being capped. In this cap or top there are two funnel-shaped openings, the one in the centre for introducing sulphuric acid, and the other near the corner for inserting the black oxide of manganese, and these funnel-shaped openings extend by a pipe thirty-two inches into the stills.

Each still is connected with two condensers, which in turn are connected with the receivers. The condensers consist of wooden troughs made of heavy poplar wood, and they are kept cool by allowing cold water to run over them. The receivers are large glass bottles, capable of holding the product of one distillation. The condensers and receivers are connected with the stills by means of lead pipe, and are made airtight by means of bank clay.

Between the condensers, and connected with them, a large glass bottle is placed, and here the uncondensed vapors escape, together with a little

Fig. 61.



Apparatus for the Distillation of Bromine.

bromine, which remains in the bottle, while the vapors pass through a large lead pipe into what is termed the flue.

This is made of square hollow sandstone pipes about two by three feet, placed upon one another, surmounted by two fire-clay chimneys. These chimneys are filled with common coal cinder or with charcoal, and this is kept moist. The escaping vapors pass into these flues, and if appreciable amounts of bromine are present it is purified, and condensed, and is obtained at the bottom of the flue. The stone retorts spoken of are capable of holding a charge of four hundred gallons of bittern, seventy-five pounds of sulphuric acid, and thirty-five pounds of black oxide of manganese. After filling them with this mixture, steam is passed into the charge. Chlorine gas is thereby liberated, which acts upon the soluble bromides and decomposes them, with the liberation of bromine, which distills over into the condensers. The resultant chlorides, after the charge is exhausted, are at the present time run off as waste products. After the bromine condenses and is collected in the receivers, it is drawn into glass stoppered bottles, each capable of holding from ten to twenty pounds, and it is now ready for market.

The apparatus (Fig. 61) consists of the following parts:

A. Opening for introducing sulphuric acid, funnel-shaped.
B. Opening for introducing oxide of manganese, funnel shaped.
C. Lead pipes connecting still with condensers.
D. Opening for letting out exhausted material.
E. The condensers.
F. Flue which receives the impurities.
I. Receiver which contains impurities before passing into the flue.
S. Pipes for passing in steam.
R. Receivers for the bromine.

—Amer. Drug., July 1884, 121.

Bromine—Method of Application as Disinfectant.—Mr. A. Frank recommends the following method of employing bromine as a disinfecfectant. The bromine is soaked up by infusorial earth, and is conveniently placed in a Brüner's pan of glass or porcelain, instead of lead, having a very deep depression in the cover. The water sealing the joint of the lid becomes charged with bromine from the interior, whence the bromine gradually diffuses into the room. To accelerate the rate of diffusion, warm water may be poured into the depression in the centre of the cover. The author, furthermore, recommends petroleum to reduce the action of bromine on organic substances with which it may come into contact, or to quickly remove its odor.—Amer. Jour. Phar., Nov. 1884, 590; Dingl. Polyt. Jour., **249**, 167.

Bromine.—Application to the the Bleaching of *Sponges*, which see under "Materia Medica."

Bromine.—Action on *Pilocarpine*, which see under "Organic Chemistry."

Bromide of Ammonium—Medicinal Value.—This salt is comparatively little used except in association with the other bromides and with hydrobromic acid, and modern experience seems to indicate that it is, perhaps, not less used than formerly, but that in the increasing use of bromides this does not increase as rapidly as the potassium salt. The taste is much more disagreeable than that of the potassium salt, and becomes more disagreeable by prolonged use, and it is more irritant and less acceptable to the stomach; in common with salines in general, it is best given in iced water. The dose is that quantity which will yield the desired degree of bromine effect. In some persons this may be ten grains three times a day, and in others fifty grains. For its full effect bromism must be induced, and the dose be then diminished so as to fall just short of that. For such use about twenty grains three times a day will be about the proper dose to begin with. Its principal use is in the treatment of epilepsy, but it is probable that the potassium salt is better adapted to this purpose.—Amer. Jour. Phar., Dec. 1884, 645; from Amer. Practitioner, November, 1884.

Hydrobromic Acid—Preparation from Bromide of Zinc.—Mr. Ad. Sommer describes the different methods in use for the preparation of hydrobromic acid, but gives preference to the following, which depends upon the decomposition of bromide of zinc by sulphuric acid. The bromide of zinc is easily prepared by action upon metallic (granulated) zinc with bromine water containing an excess of bromine in suspension. The solution is drawn off and quickly concentrated so as to obtain the solid bromide of zinc. In order to obtain the definite hydrate of hydrobromic acid containing 5 molecules of water, the following mixture is distilled in a retort:

	Parts.
Bromide of zinc	225
Sulphuric acid (calc. as H_2SO_4)	196
Water enough so as to amount, with the water accompanying the H_2SO_4, to	180

The molecular proportions are:

$$\begin{array}{ccccccc} ZnBr_2 & + & 2H_2SO_4 & = & ZnSO_4.H_2SO_4 & + & 2(HBr.5H_2O) \\ \text{zinc bromide} & & \text{sulph. acid} & & \text{acid sulphate of zinc} & & \text{hydrobromic acid} \end{array}$$

The product is freed from accompanying traces of sulphuric acid by adding a sufficient quantity of barium carbonate, and then again distilled (boiling point 123° C.).—Amer. Drug., Nov. 1884, 208, from Jour. of the Soc. of Chem. Ind.

Hydrobromic Acid—New Method of Preparation.—Mr. Léon Crismer obtains hydrobromic acid, pure and in a gaseous condition, as follows: A piece of white (or colorless) phosphorus is weighed under (enough) liquid paraffin (to cover it), and the quantity of bromine weighed off which is necessary to convert the phosphorus into tribromide. Each 10 gm. of phosphorus requires 77 gm. of bromine and 18 gm. of water. The phosphorus is then transferred to a small flask, and covered with a layer of liquid paraffin of one finger in thickness. The flask is closed with a doubly perforated cork, through one of which openings passes a perpendicular tube serving as an upright condenser. Through the other passes a globe funnel with stop-cock, serving as the reservoir of bromine.

While the flask is kept constantly well cooled, the bromine is allowed to enter in drops. When it is all added, the requisite amount of water is placed into the funnel, and allowed to flow, drop by drop, upon the tribromide of phosphorus, which causes a regular development of gaseous hydrobromic acid. This is purified by allowing it to pass through a bent tube containing a little red phosphorus and anhydrous phosphoric acid, provided it is desired to obtain it completely anhydrous. Finally, the mixture is heated on the sand-bath, in order to drive over the last traces of hydrobromic acid. The yield is very nearly that required by theory.

Hydriodic acid is prepared in the same manner. The iodine is at first added in small quantities to the phosphorus covered by the liquid paraffin; afterwards water is added, and the mixture lastly heated on the sand-bath.—Amer. Drug., July 1884, 124; Ber. d. Deutsch. Ch. Ges., 1884, 651.

Hydrobromic and Hydriodic Acid.—Preparation by the aid of *Paraffine Oil,* which see under "Hydrocarbons."

Hydrobromic Acid—Doses—According to the experience of Dr. H. C. Wood, who has been using hydrobromic acid in epileptic cases, this drug must be used in much larger doses than is customary if any benefit is to be derived from it. He found in three instances that half ounce doses of the officinal hydrobromic acid were much more effectual than equivalent doses of bromide of sodium, or potassium, and not nearly so liable to produce symptoms of bromism. He gives the acid after meals, with syrup, and diluted with half a pint of water.—Amer. Jour. Pharm., July 1884, 365; from Med. News.

Hypobromites—Keeping Qualities of Solutions.—Mr. A. H. Allen has made some experiments in order to determine the keeping qualities of solution of hypobromites. The reaction between caustic soda and bromine at first takes place according to the following scheme:

$$\underset{\text{soda}}{2NaHO} + \underset{\text{bromine}}{Br_2} = \underset{\substack{\text{sodium}\\\text{hypobromite}}}{NaBrO} + \underset{\substack{\text{sodium}\\\text{bromide}}}{NaBr} + \underset{\text{water.}}{H_2O}$$

After some time, however especially after warming, the following decomposition ensues:

$$\underset{\text{sodium hypobromite}}{3NaBrO} + \underset{\text{sodium bromide}}{3NaBr} = \underset{\text{sodium bromate}}{NaBrO_3} + \underset{\text{sodium bromide}}{5NaBr}$$

This is the reason why solutions of hypobromites have hitherto always been considered as unstable. It has, however, been ascertained by Mr. Allen that these solutions may be kept unaltered for a long time, and may even be heated to boiling without material change, if they contain a sufficient quantity of *free* caustic soda.

If the hypobromite solution is to be used for estimating oils and fats in *alkaline* solution, its constancy of strength is of importance. When the determinations are to be made in a solution acidified with hydrochloric acid, the constancy is immaterial, since the whole of the bromine is set free:

$$a.\quad \underset{\substack{\text{sodium}\\\text{hypobromite}}}{3NaBrO} + \underset{\substack{\text{sodium}\\\text{bromide}}}{3NaBr} + \underset{\substack{\text{hydro-}\\\text{chloric acid}}}{6HCl} = \underset{\substack{\text{sodium}\\\text{chloride}}}{6NaCl} + \underset{\text{bromine}}{6Br} + \underset{\text{water}}{3H_2O}$$

and,

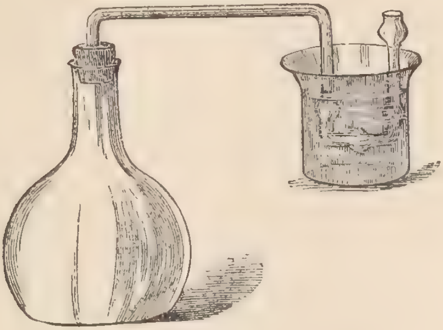
$$b.\quad \underset{\substack{\text{sodium}\\\text{bromate}}}{NaBrO_3} + \underset{\substack{\text{sodium}\\\text{bromide}}}{5NaBr} + \underset{\substack{\text{hydro-}\\\text{chloric acid}}}{6HCl} = 6NaCl + 6Br + 3H_2O \text{ (as before).}$$

Prof. Allen has made the curious observation, so far remaining unaccounted for, that in all experiments made by him, the quantity of bromine found in the solutions by actual analysis was *higher* than that which was originally added.—Amer. Drug., Oct. 1884, 195; Journ. Chem. Soc. and Dingl. Pol. Journ.

IODINE.

Iodine, Bromine and Chlorine—New Method of Testing.—Mr. Edward Hart proposes a new method for testing for the haloids. If nitrates, chlorates, bromates, or iodates are present, it is necessary to fuse the substances with a little sodium carbonate and charcoal to reduce them. If the haloids are united with silver, it is best to fuse with sodium carbonate and extract with water, although with iodine and bromine this is not absolutely necessary. The substance is placed in a flask (shown by Fig. 62) with some water and a few drops of solution of ferric sulphate. In the bulbs are poured a few drops of dilute starch paste. The bulbs are kept cold by immersing in water in a beaker. The contents of the flask are then boiled, and if iodine is present, the starch is colored blue. This test is extremely delicate. If iodine is found, the cork with the bulb tube is removed, and the solution boiled until on testing again in the same way no more iodine is found. If much iodine is present, it is necessary to add more ferric sulphate solution. The bulb tube is now cleaned, charged with a few drops of water and a drop or two of chloroform, and a very small crystal of potassium permanganate added to the solution in the flask. The contents of the flask are boiled again, and if bromine is present, the chloroform becomes red. The tube is now removed and more potassium permanganate and ferric sulphate added, little by little, boiling between each addition until the bromine has all been driven off. A few drops of alcohol are added to the contents of the flask to decolorize any excess of permanganate, and after filtration chlorine is tested for in the filtrate with silver nitrate. Mixtures were given to three qualitative students, neither of whom had used the test, and the results given by the author in an appended table, prove the method to be serviceable and reliable. It should be observed, however, that the presence of a large amount of bromine decreases the delicacy of the test for iodine. The solution of ferric sulphate is made as follows: Copperas is dissolved in water, oxidized with nitric acid, the solution precipitated with ammonia, and the precipitate washed by decantation and finally brought on a filter. 50 cc. of dilute sulphuric acid (1 acid to 1 water) is then saturated with the still moist precipitate, and to the solution 50 cc. of the same sulphuric acid is added.—Amer. Drug., Febr. 1885, 27; from Chem. News, Dec. 1884.

FIG. 62.



Apparatus for Testing for Haloids.

Iodine—Ammonia Chloride of Silver a Test.—Prof. Chas. O. Curtman draws attention to a new test for iodine, which has been used for some time by Dr. Frericks. The reagent, which is able to reveal small quantities of iodine in presence of all other members of the chlorine group, is made by precipitating an aqueous solution of nitrate of silver by chloride of sodium, separating the silver chloride by filtration, washing it thoroughly, and then dissolving it in an excess of water of ammonia.

This ammonia-chloride of silver will produce a yellow precipitate of silver iodide in liquids containing even a trace of a soluble iodide.—Amer. Drug., April 1885, 74; from National Druggist.

Iodine Solutions—Determination of Titre.—Mr. Jassoy draws attention to the following method for determining the titre of iodine solutions, which method is not as circumstantial as those in common use. Prepare a $\frac{1}{30}$ normal solution of purified bichromate of potassium, containing 4.92 gm.

per litre. This solution when once prepared and kept so that it cannot lose water by evaporation, retains its original strength permanently. The bichromate must first be completely freed from sulphuric acid by repeated crystallization, and finally fused in a porcelain capsule, with avoidance of too high a heat. On cooling, it falls to a fine crystalline powder, and is in the most suitable condition for exact weighing.

If it be now desired to ascertain the exact titre of the volumetric solution of hyposulphite of sodium (see U. S. Ph., p. 395), 25 cc. of the bichromate solution are introduced into a stoppered flask of the capacity of 300 to 400 cc. (10 to 13 fl. oz.), 100 cc. (about 3 oz.) of water are added then 5 cc. of hydrochloric acid, and finally 1.5 to 2 gm. of *pure* iodide of potassium. The flask is closed and allowed to stand for a few minutes, when the whole of the iodine of the iodide of potassium added will have been liberated. Next, enough hyposulphite solution is added from a burette until all the iodine is fixed, and the liquid has acquired a faint bluish color from the presence of chloride of chromium, without the least tint of yellow. This point may be reached in daylight, even without the aid of an indicator, to a drop. Supposing 25.4 cc. of the hyposulphite solution had been used for fixing the iodine liberated by the 25 cc. of bichromate solution originally employed, then the "factor" for the hyposulphite solution [which only in very rare cases, or by accident, will correspond with the iodide solution cubic centimeter for cubic centimeter, or 1 to 1] will be $\frac{25}{25.4} = 0.984$.

Now, if it is also desired to learn the exact titre of the iodine solution, so as to ascertain its "factor," it is only necessary to multiply the number of cc. of "hypo" solution required for fixing the iodine in a given volume of the $\frac{1}{10}$ iodine solution (see U. S. Ph., p. 396), with the factor previously ascertained for it, and to divide the product by the number of cc. of the iodine solution used. Supposing for 20 cc. of iodine solution of unknown strength, 20.3 cc. of the above-mentioned "hypo" solution had been consumed, the "factor" of the iodine solution will be

$$\frac{20.3 \times 0.984}{20} = 0.998.$$

It will thus be seen that every incorrect volumetric liquid may be rendered available and correct by ascertaining its factor—that is, the fraction which must be used, in place of the figure 1, to measure its equivalence with its corresponding test liquid.—Amer. Drug., April 1885, 74, from Rundschau (Leitmeritz).

Iodine—Percentage in Cod Liver Oil and Oysters.—In a former paper (see Proceedings 1884, 204–205), Mr. Edward C. C. Stanford had drawn attention to the fact that the proportion of iodine in cod liver oil is much less than that published by other observers. He has since determined the iodine in two authentic samples of cod liver oil—one furnished by Mr. Gale, of Messrs. J. Bell & Co., the other prepared by himself—and the present results fully support those previously obtained. They are given as follows:

		Per cent.
Cod liver oil, Gale, filtered		.000040
"	" unfiltered	.000052
"	" marc	.000200
"	Stanford	.000077
"	" marc	.000765
"	" water.	.000680

The author also determined the amount of iodine in oysters from Portugal, planted and nursed in England, which have the reputation of being specially rich in iodine and bromine, and have on this account been recommended by Dr. Champouillon to the attention of medical men. The latter has found such oysters to yield .0039 per cent. bromine and .0062 per cent. iodine. Mr. Stanford found them to yield only .00004 per cent. of iodine, or 4 parts in 10 millions, a proportion certainly of doubtful medicinal value, whatever the value of the oysters may be.—Amer. Jour. Phar., Nov. 1884, 582–583, from Pharm. Jour. and Trans., Sept. 20, 1884, 233.

Iodide of Potassium—Manufacture.—Mr. C. F. Capaun-Karlowa discusses the different available methods for preparing iodide of potassium. He finds that the most advantageous method is that originally recommended by Duflos, which consists in allowing iodine to act upon zinc in presence of water, precipitating the resulting iodide of zinc by means of carbonate of potassium, removing any remaining metal from the iodide of potassium solution by hydrosulphuric acid, filtering and crystallizing. Although iodine and zinc are further apart in the electro-chemical series than iodine and iron, yet their union take place with less energy. As the zinc, when working this process on a large scale, must be used in a granulated condition, a large excess of it is necessary, in order to present enough surface to the iodine. The undissolved portion, of course, can be used in the next operation. If 1 part each of iodine and granulated zinc, and two parts of water, are brought together at the ordinary temperature, no reaction ensues. On gradually warming, a slow action is started, the liquid first acquires a yellowish color and gradually becomes dark-brown. After two or three hours, it again gradually becomes lighter colored, and finally as colorless as water. The liquid is now filtered and the remaining zinc washed with distilled water and put aside. The united liquids are heated to boiling and mixed with enough solution of carbonate of potassium until no more precipitate is produced. The reaction takes place as follows:

$$\begin{array}{ccccccccccc} 5ZnI_2 & + & 5K_2CO_3 & + & 3H_2O & = & 10KI & + & 2ZnCO_3\,3(ZnOH_2O) & + & 3CO_2 \\ \text{iodide} & & \text{carb. of} & & \text{water} & & \text{iodide} & & \text{basic carbonate of} & & \text{carbonic} \\ \text{zinc} & & \text{potassium} & & & & \text{potassium} & & \text{zinc} & & \text{acid gas} \end{array}$$

Since the escaping carbonic acid gas causes a good deal of effervescence, capacious vessels must be used for the operation; and in order that *all* the zinc be precipitated, an excess of carbonate of potassium must be used. To insure the complete precipitation of the zinc, the filtrate must be tested with sulphide of ammonium, and, if necessary, the liquid must be digested (warm) for some time with the carbonate of potassium added in excess. The precipitate is washed with distilled water until the washings no longer affect mercuric chloride. Since the precipitated carbonate of zinc is quite compact, the washing is easily performed. The excess of carbonate of potassium still remaining in the liquid is now neutralized or nearly so with hydriodic acid, and hydrosulphuric acid gas is then conducted through the liquid, in order to remove every trace of metal. Finally the liquid is filtered, if necessary, heated to drive off the excess of hydrosulphuric acid, and then evaporated [to the crystallizing point or] to dryness. This method has the advantage of being simple, and not causing any notable loss of iodine through violence of the reaction; nor need the operation be hastened, as the products are not affected by exposure to the air. The washing of the precipitated carbonate of zinc, however, must be continued for a considerable time, until all the iodide of potassium has been washed out of it. The author lays special stress upon the necessity of adding a *considerable* excess of carbonate of potassium, to insure the complete precipitation of the zinc.—Amer. Drug., Nov. 1884, 215; from Neueste Erfind. u. Erfahr.

Ferrous Iodide—Preservation.—According to Sylvio Plevani, ferrous iodide, dissolved in glycerin, does not undergo any alteration. He recommends the following formula:

Digest 20 gm. iodine, 10 gm. card teeth and 30 gm. water; filter into a porcelain capsule containing 75 gm. of glycerin, and evaporate to 100 gm.

This solution contains 23 gm. of ferrous iodide, and, since it is miscible in all proportions with water, alcohol and syrups, and may also be incorporated with fats and oils, it is a preparation offering great convenience in dispensing.—Amer. Jour. Phar., April 1885, 172; Bollet. Farmaceut.; Pharm. Ztg., 1885, p. 9.

Iodates—Formation in Natural Deposits.—In consideration of the fact that the iodine in the nitre-beds of Peru occurs in the state of iodate, while elsewhere it occurs in an unoxidized condition, Mr. Muntz was led to inquire as to the possibility of there being any connection between this oxidation and that taking place in the formation of nitrates, especially under the influence of the organisms which have been demonstrated to possess the power of effecting the nitrification of nitrogenous matter. It was found that upon adding small quantities of iodide of potassium to a medium in course of nitrification, oxidation of the iodine was not always observed. But when the mixture was placed under the conditions most favorable to nitrification, especially in regard to temperature and air, the iodine also was affected by the general oxidation, iodic acid and lower oxides of iodine being formed. Mr. Muntz therefore thinks that the iodates present in the nitre-beds of Peru may be regarded as having been formed in the course of the nitrification at the expense of iodide. It has also been ascertained that the organisms which reduce nitrates to nitrites, in the absence of air, are capable of removing oxygen from iodates under the same conditions.—Compt. Rend., c., 1136; Phar. Jour. and Trans., May 30, 1885, 987.

PHOSPHORUS.

Phosphoric Anhydride—Modifications.—According to Messrs. Hautefeuille and Perrey, there are three distinct phosphoric anhydrides: one crystalline, another amorphous and pulverulent, and a third amorphous and vitreous, the latter two being polymers of the first. All three may be seen formed in burning phosphorus in a glass tube traversed by a current of dry air, the crystalline anhydride being deposited in the colder part of the tube, the pulverulent anhydride in the moderately-heated part, and the vitreous anhydride in the part heated to redness. The crystalline anhydride may be obtained separately by distillation, at a temperature of 250° C. of the products of the complete combustion of the phosphorus; it forms transparent colorless, strongly-refracting crystals. At a little above this temperature the crystals undergo polymerization, and are converted into the amorphous pulverulent form, whilst the vitreous form is produced upon heating either of the others to redness under pressure. Both the amorphous anhydrides are convertible into the crystalline form by sublimation.—Répert. de Phar. xii., 360; Phar. Jour. and Trans., Aug. 30, 1884, 163.

Phosphoric Acid—Uniform Scheme of Determination.—The Association of Official Agricultural Chemists have agreed upon the following uniform scheme, for the session of 1884–85:

1. The sample should be well intermixed and properly prepared, so that separate portions shall accurately represent the substance under examination, without loss or gain of moisture.

2. *Water-Soluble Phosphoric Acid.*—Bring 2 gm. on a filter; add a little water; let it run out before adding more water, and repeat this treatment cautiously until no phosphate is likely to precipitate in the filter. (The washings may show turbidity after passing the filter.) When

the substance is nearly washed in this manner, it is transferred to a mortar and rubbed with a rubber-tipped pestle to a homogeneous paste (but not further pulverized), then returned to the filter and washed with water until the washings no longer react acid with delicate test-paper. Mix the washings. Take an aliquot part (usually corresponding to one-third or one-half of a gramme of the substance), and determine phosphoric acid as under total phosphoric acid.

3. *Citrate-Insoluble Phosphoric Acid.*—Wash the residue of the treatment with water into 150 cc. flask with 100 cc. of strictly neutral ammonium citrate solution of 1.09 density; shred and add the filter paper; cork the flask securely; place in a water-bath with constant temperature of 65° C., and digest for thirty minutes, with frequent shaking. Filter the warm solution quickly, and wash with water of ordinary temperature.

Transfer the filter and its contents to a porcelain capsule. Ignite until the organic matter is destroyed; treat with 10 to 15 cc. of fuming hydrochloric acid; digest over a low flame until the phosphate is dissolved; dilute to 200 cc., mix; pass through a dry filter; take an aliquot, and determine phosphoric acid as under total.

4. *Total Phosphoric Acid.*—Weigh 2 gm. into a capsule, add and mix intimately with 4 to 7 cc. of a nearly saturated solution of magnesium nitrate, dry, ignite gently; if necessary, moisten the residue with nitric acid and ignite again to destroy all organic matter; add to the residue 15 to 20 cc. of fuming hydrochloric acid; digest at a gentle heat until all the phosphates are dissolved; dilute to 200 cc., mix; pass through a dry filter; take 50 cc. of filtrate; neutralize with ammonia; add about 15 gm. dry ammonium nitrate, and to the hot solution, for every decigramme of P_2O_5 that is present, 50 cc. of molybdic solution. Digest at about 65° C. for an hour; filter and wash with ammonium nitrate solution. (Test the filtrate by renewed digestion and addition of more molybdic solution.)

Dissolve the precipitate on the filter with ammonia and hot water, and wash into a beaker to a bulk not more than 100 cc. Nearly neutralize with hydrochloric acid; cool, and add magnesia mixture from a burette, slowly (one drop per second), and stirring vigorously. After fifteen minutes add 30 cc. of ammonia solution of density of 0.96. Let stand several hours. (Two hours are usually enough.) Filter, wash with dilute ammonia; ignite intensely for ten minutes, and weigh.

5. *Citrate-Soluble Phosphoric Acid.*—The sum of the water-soluble and citrate-insoluble, subtracted from the total, gives the citrate-soluble.

PREPARATION OF REAGENTS.

1. *To prepare Ammonium Citrate Solution.*—Mix 270 gm. of commercial citric acid with 1500 cc. of water; nearly neutralize with crushed commercial carbonate of ammonia, 410 gms., heat to expel the carbonic

acid, cool; add ammonia until exactly neutral (testing for excess both of acid and alkali by aid of delicate red and blue litmus papers), and bring to volume of two litres. Dilute further until the density is 1.09 as tested by the balance or *accurate* specific gravity spindle.

2. *To Prepare Solution of Magnesium Nitrate.*—Dissolve 320 gm. of "calcined magnesia" in nitric acid, avoiding excess of the latter; then add a little "calcined magnesia" in excess, and boil; filter from the excess of magnesia, ferric oxide, etc., and bring to volume of 2 litres.

3. *To Prepare Molybdic Solution.*—Dissolve 100 gm. of molybdic acid in 400 gm. or 417 cc. of ammonia of sp. gr. 0.96, and pour the solution thus obtained into 1500 gm. or 1250 cc. of nitric acid of sp. gr. 1.20. Keep the mixture in a warm place for several days, or until a portion heated to 40° C. deposits no yellow precipitate of ammonium phosphomolybdate. Decant the solution from any sediment, and preserve in glass-stoppered vessels.

4. *To Prepare Ammonium Solution.*—Dissolve 200 gm. of commercial ammonium nitrate in water, and bring to a volume of 2 litres.

5. *To Prepare Magnesia Mixture.*—Dissolve 22 gm. of recently ignited "calcined magnesia" in dilute hydrochloric acid, avoiding excess of the latter. Add a little "calcined magnesia" in excess, and boil a few minutes to precipitate iron, alumina and phosphoric acid; filter, add 280 gm. of ammonium chloride, 700 cc. of ammonia of sp. gr. 0.96, and water enough to make the volume of 2 litres. Instead of the solution of 22 gm. of "calcined magnesia," 110 gm. of crystallized magnesium chloride ($MgCl_26H_2O$) may be used.

6. *Dilute Ammonia for Washing.*—One volume ammonia of sp. gr. 0.96, mixed with three volumes of water, or *usually* 1 volume of concentrated ammonia with 6 volumes of water.—Amer. Drug., April 1885, 74, from Chem. News.

Phosphoric Acid—Examination of Commercial Samples.—Harry Lovett Miller, Jr., examined four samples of commercial phosphoric acid, and found these to respond to the pharmacopœial tests for purity, except that two samples contained slight traces of phosphorous acid, and one sample was contaminated with arsenic, which, estimated as $Mg_2As_2O_7$ was found to be .031 per cent. As_2O_3. The specific gravities ranged between 1.229 and 1.347, and on evaporating 5 gm. of the acid with 10 gm. PbO and and igniting, the residues weighed respectively 11.29, 11.57, 11.60 and 11.66 gm.; the Pharmacopœia requires 11.81 gm.—Amer. Jour. Pharm., Nov. 1884, 572.

Hypophosphites with Iron.—Preparation of a stable *syrup*, which see under "Pharmacy."

BORON.

Boric Acid—Use for Preserving Food.—From a series of experiments made with a view to determine the action of boric acid on the animal system, J. Forster draws the following conclusions: The admission of boric acid as an addition to food, even in small doses, is injurious to the digestive organs. This injurious action depends on the circumstance that boric acid acts so as to materially increase the proportion of solid matters and nitrogen in the fæces separated. It is also a remarkable coincidence that the action of boric acid on the intestinal discharge is well marked, even by the exhibition of as little as 0.5 gram per diem. Moreover, this action is in direct relation to the quantity of acid taken, and is maintained for some time after the doses of acid have ceased. The action described is perceptible, not only with vegetable or animal foods, which contain a large proportion of indigestible ingredients, but also when highly digestible food, such as milk and eggs, is taken. Food to which boric acid has been added tends to cause an increase in the secretion of gall during assimilation. Its most important action, however, is in the increase which it causes in the discharge of albuminous substances from the intestinal canal. From this it is evident that its use as a food preservative is not as beneficial as hitherto assumed.—Amer Jour. Phar., Nov. 1884, 597; Ding. Polyt. Jl., **251,** 170–172.

SILICON.

Silicates—Fusing Agent.—Mr. Holthoff recommends bicarbonate of of sodium, in quantity of 12 to 15 times that of the silicate, as the best fusing agent for the latter. Both the silicate and the bicarbonate (the pure crystallized form) must be very finely powdered. One-fourth of the bicarbonate is first put into the platinum crucible. Another fourth, or rather more, is intimately mixed with the silicate in a warmed capsule, and this mixture further mixed with another fourth upon glazed paper, when it is transferred into the crucible. The last fourth is used for rinsing the capsule and paper, and placed on top of the whole mixture in the crucible, which should not be much more than half full. At first, only the bottom of the latter should be carefully heated, then the heat is gradually increased during 15 minutes, until the lower half of the crucible is at a low red heat, without allowing the mass to melt. Finally, the heat is raised, if necessary, with the blast lamp. When the mass is in a quiet flow, without evolving any more gas, the operation is finished.—Amer. Drug., Mar. 1885, 51; from Zeitsch. Anal. Chem. and Chem. News.

Hardened Glass—New Process.—Mr. Frederick Siemens describes a process for hardening glass which he claims to be more economical than that of de la Bastie, and to yield a product not so liable to "fly" as toughened glass. The principle of the process lies in securing the uniform cooling of the glass, by means which appear much more easily applicable to articles with flat than with curved surfaces. In the case of sheet glass the material, having been cut in the ordinary way to the shape and dimensions required, is exposed to radiant heat in a furnace until quite soft, and then cooled by placing it between cold metal plates, leaving it free at the edges. So rapidly and uniformly are these operations conducted that a sheet of glass can be heated in one minute, and by using copper plates can be cooled in half a minute. The furnaces are peculiarly constructed, the flame being about three feet from the glass, radiant heat being the only means of securing a uniformity of temperature throughout the glass, which is as necessary to the success of the operation as a uniform temperature during cooling. Considerable ingenuity, also, has been exercised in the manipulation of the soft glass during its removal from the furnace to the cooling plates, which is effected by means of wooden shovels impregnated with water glass to make them incombustible. The hardened glass so produced is claimed to stand in a similar relation to ordinary glass as steel to iron ; it is stated that although the surface may be scratched with a diamond, the glass cannot be cut, nor does it split like ordinary glass. Inferior degrees of hardness are obtained by using cooling plates of less conductive material, and the glass is not then heated to so high a temperature. A process of casting has also been devised, in which the molten glass is poured into a mould made of material having as nearly as possible the same conductivity and capacity for heat as glass. The mould is previously heated to a temperature uniform with that of the molten glass, and the mould and glass then cool together like a homogeneous body.—Phar. Jour. and Trans., March 28, 1885, 789.

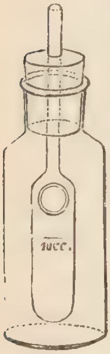
CARBON.

Carbon—Diffusibility Through Porcelain.—Violle has observed that if a porcelain crucible, inserted into a black-lead crucible, be heated to about 1,500° C. (melting-point of palladium), the latter will look as light-colored as if made of clay, while the porcelain crucible is quite black.—Amer. Jour. Phar., Jan. 1885, 24; from Ber. d. Deutsch. Ges., xv., p. 275.

Purified Animal Charcoal—Difficulties to Secure a Good Article.—Dr. E. R. Squibb, in connection with his paper on *cocaine* (which see), observes that it is difficult to obtain good bone-black in the market. Good effective bone-black must be pure carbon in the peculiar state of aggregation given by the burning and washing. It should be perfectly black in color, and when boiled with dilute solution of caustic potassa, should yield a colorless supernatant liquid. If not well burned the liquid will have a brown tint. Burned from a platinum foil it should leave no residue, or merely traces. It should be a fine powder, and after being well washed, first with hydrochloric acid and then with water, it need not be dried, but simply be drained and kept in a moist state for use. Good sugar-house bone-black when re-burnt and washed was quite effective.—Ephemeris, Jan. 1885, 721.

Carbonic Acid—Simplified Apparatus for Determination.—Dr. G. Loges describes a modification of Scheibler's carbonic acid apparatus, rendering its construction more simple. The outer vessel (Fig. 63) may be an ordinary wide-mouth bottle of 15 cm. (6 in.) in height and 6 cm. (2⅜ inches) in diameter. Through the perforated rubber stopper passes a glass tube, to which is fused a cylindrical glass tube of about 8 cm. (3⅛ in.) long and 2.5 cm. (1 in.) in diameter, having a lateral opening and shoulder for pouring out from near its upper end: also a scratch or mark for the requisite amount of acid it is to hold. The substance to be decomposed is put in the flask, the inner glass-cylinder charged with acid, and the apparatus put together, whereupon the acid is made to run out upon the substance.—Amer. Drug., July 1884, 132; from Z. f. Anal. Chem.

Fig. 63.



Carbonic Acid Apparatus.

Solid Carbonic Acid—Collection, etc.—Mr. H. Landolt prefers the cloth bags which have long been supplied by Bianchi, of Paris, to the ordinary tin boxes for the collection of solid carbonic acid. These bags are conical in shape, about 40 centimetres long, and about 17 centimetres across the wide end. They are of woolen material, and the wide end can be drawn together by a tape. The narrow end is fastened to a wooden tube which fits over the nozzle of the carbonic acid cylinder. The waste of acid is much less than with the ordinary box. The solid acid keeps much longer if compressed. For this purpose the author uses slightly conical moulds of hard wood, fitted with wooden pistons. Specimens obtained by hammering the solid acid into these moulds have the appearance and approximate hardness of chalk, and may be lightly handled without danger. A specimen 53 millimetres long and 71 millimetres in diameter took 5 hours to volatilize. The author finds the average density of his specimens to be slightly under 1.2.—Ber. d. D. Chem. Ges. xvii, 309–311; Phar. Jour. and Trans., January 3, 1885, 524.

CYANOGEN.

Cyanogen—Test.—According to Vogl, cyanogen may be detected by passing a current of vapor containing the cyanide in a volatile or gaseous condition through a strong solution of soda, and then adding to the latter some previously neutralized picric acid, whereby a very deep red color is immediately produced. The author has succeeded in finding cyanogen in the smoke of tobacco and in illuminating gas by means of this method. —Amer. Drug., Feb. 1885, 35, from Sitzungs ber. der Münch. Akad.

Hydrocyanic Acid—Modification of Liebig's and the U. S. P. Processes of Determination.—In a former article (see Proceedings, 1875, 264) Mr.

Louis Siebold had called attention to the serious errors to which Liebig's process for the volumetric estimation of hydrocyanic acid is liable if the titration be conducted in the presence of less alkali than is requisite for the complete conversion of the acid into cyanide of sodium. The author now suggests that, since an excess of alkali, unless unreasonably large, does not affect the result to more than a slight extent, by employing an excess the test is available for pharmaceutical uses, and may be made absolutely accurate by repeating the experiment, using in the second determination only a very slight excess of alkali, such excess being determined by the full knowledge of the quantity required from the results of the first titration.

The author has furthermore confirmed the favorable opinion of the process of the U. S. Pharmacopœia expressed in last year's paper (see Proceedings 1884, 223). Nevertheless, he does not regard it equal to Liebig's method, worked in accordance with his suggestions, and it has the disadvantage of being impaired by the presence of hydrochloric acid and chlorides. Moreover, unless worked rapidly, there is liability to loss of hydrocyanic acid by volatization. To prevent this, it is best to place the magnesia in a beaker, along with the chromate of potassium, then to add the hydrocyanic acid from a pipette, and now rapidly to run the silver solution from a burette, until the red color produced on the surface begins to disappear less rapidly on stirring, after which the remainder of the silver solution may be added drop by drop until the reaction is completed. —Yearbook of Pharm., 1884, 464–467.

SODIUM.

Alkalimetry—New Indicators.—Messrs. Engel and Ville draw attention to two new indicators for the alkalimetric estimation of caustic alkalies in the presence of carbonates. The first is

Sulphindigotic Acid, which may be prepared by neutralizing the ordinary solution of indigo in fuming sulphuric acid with calcium carbonate, diluting with ten volumes of water, and filtering. The blue color of this liquid is not altered by alkaline carbonate, whilst caustic potash or soda gives with it a yellow color. In estimating caustic potash, for instance, in the presence of carbonate of potassium, a few drops of sulphindigotic acid are added to the liquid; the titrated acid is then added until the yellow liquid, after passing through green, becomes uniformly blue, which indicates the point at which the caustic potash has all been neutralized. The other indicator is the compound known as

Poirier's Soluble Blue, C. 4 B., which in aqueous solution (1:500) is described as being more sensitive. The solution remains blue in the presence of alkaline carbonates, and reddens under the influence of caustic bases, and is used similarly to sulphindigotic acid.—Phar. Jour. and Trans., May 2, 1885, 893; Compt. Rend. c., 1073.

Alkalimetry—Compound Indicator.—According to Mr. A. Gawalovsky, a mixture of an alcoholic solution of phenolphthaleïn with dimethylaniline orange is recommended as indicator in alkalimetry or acidimetry. The mixture is lemon-yellow when quite neutral, whilst when acid it is rose-red; when alkaline, deep-red.—Amer. Drug., Mar. 1885, 49; from Biederm. Centralhl.

Alkalimetry—Gallein, a New Indicator in Volumetric Analysis, which see under "Organic Bases."

Salts with Alkaline Reaction—Iodized Tannic Acid a Reagent.—Dr. O. Schweissinger observes that if alcoholic solutions of iodine and of tannin are mixed together in equal volumes, and if two drops of the mixture are added to 20 cc. of spring water, a rose color is produced, which disappears again in a short time. Distilled water does not give this reaction. Further experiment showed that this reaction is occasioned by all alkalies and alkaline earths, and their carbonates, bicarbonates, borates, and phosphates—in short, by all salts which have a slight alkaline reaction. If 1 part of potassium carbonate is dissolved in 100,000 parts of water, 20 cc. of the solution gave an intense rose color with 2 drops of the reagent. Even at a dilution of 1 : 1,000,900 the reaction was still manifest. Sulphates and chlorides do not give this reaction, but their presence in small quantities does not interfere. The rose color is distinguishable in dilute solutions only; in strong ones it is masked by a brown color.—Amer. Drug., May 1885, 89, from Chem. News, Mar. 6, 1885.

Sodium—A New Reagent for its Presence.—Dr. H. Hager describes a new reagent for showing the presence of sodium and sodium salts, which, though subject to several limitations as to its applicability, would seem to give more satisfactory qualitative indications than the flame test, in such cases as the examination of potassium carbonate or hydrate. It consists of a solution of *potassio-stannous chloride*, made by dissolving five parts of crystals of chloride of tin in ten parts of distilled water and adding sufficient potash solution, sp. gr. 1.145, to render it nearly, but not quite clear; after standing an hour, five parts more of potash solution and fifteen of water are added, the solution is again allowed to stand for some hours and then filtered. The solution to be examined, if acid, should be made faintly alkaline with pure potash solution, or if decidedly alkaline, neutralized with hydrochloric acid, and any salts of the earth metals should be separated by pure potassium carbonate. Boric acid also interferes with the reaction, and a solution containing sodium borate requires to be mixed with potassium chloride or sulphate before adding the tin reagent. In the presence of any of thé salts of sodium the reagent gives, after two or three minutes, a white precipitate or turbidity, even with only minute traces—a fact that should be remembered in preparing it, as caustic potash is seldom quite free from soda. Lithium and ammonium salts seem to behave toward this reagent similarly to sodium salts, except that the reaction with lithium is not influenced by the presence of a borate. As alcohol in the proportion of eight per cent. also gives a white turbidity with potassio-stannous chloride, its presence would require to be excluded.—Amer. Drug., August 1884, 155.

Bicarbonate of Sodium—Precaution Against Loss of Carbonic Acid.—Dieterich recommends keeping the bicarbonate in a cool place and in tightly stoppered containers, since it is apt to lose part of its carbonic acid, and thus be converted into mono-carbonate if exposed to the air.—Amer. Jour. Phar., Jan. 1885, 26, from Phar. Zeit. Russ., xxiii., 387.

AMMONIUM.

Ammonium Hydrate—Denial of Its Existence.—It is generally held that solution of ammonia contains the latter in form of ammonium hydrate NH_4OH, a cold saturated solution of which has a specific gravity of 0.912, and contains 23.226 per cent. of ammoniacal gas. Even supposing that the ammonium hydrate did exist, and that it were constituted analogous to potassium hydrate, it is a very unstable compound, since the ammoniacal gas is readily eliminated by exposure to, or the passage of a current of air.

Prof. J. Thomsen, of Copenhagen, deduces from physical and thermic experiments that such a compound as ammonium hydrate does not exist. He has arrived at this result by several methods independent of each other. For instance, if the heat-units are calculated which are set free when soluble hydrates are dissolved, and if these figures are compared with the heat-unit observed during the supposed formation of the ammonium hydrate, it will be found that theory agrees with the fact in every case but that of the ammonium.

		Heat of Combination (on solution).	
		Calculated.	Found.
Sodium	Hydrate	77.7	77.6
Lithium	"	83.4	83.3
Thallium	"	20.4	20.0
Calcium	"	150.6	150.1
Barium	"	$28.4 + x$	$20.8 + x$
Strontium	"	158.6	158.2
Ammonium	"	54.2	21.

From this it follows that the composition of the water of ammonia differs from that of a solution of alkalies.—Amer. Drug., Jan. 1885, 16, from Comptes Rend., xcviii., 812.

CALCIUM.

Plaster of Paris—Hardening Process.—Mr. Julhe describes a new process for hardening plaster of Paris, so that it may be used, among other purposes, for floor parqueting. It consists of mixing the plaster before using it for casting with one part in six of finely-sifted recently slacked lime, and saturating the well-dried casting with solution of a sulphate of a base giving an insoluble precipitate with lime. Sulphate of zinc and sulphate of iron are both suitable. The sulphate of zinc gives a white material; that of iron at first greenish, but upon drying acquires the color of ferric oxide. A coating of boiled linseed oil converts this into a mahogany color, and a coat of copal varnish gives a fine surface. The casting should be well dried before treating it with the sulphate solution, and after being immersed not longer than ten hours it should be again dried; it may then be replaced in the solution until the saturation is complete. The product is said to resist atmospheric influences, and when sulphate of iron is used the resistance to fracture is said to be twenty times greater than in ordinary plaster.—Phar. Jour. and Trans., Mar. 28, 1885, 789; Compt. Rend. c., 797.

MAGNESIUM.

Hydrosulphide of Magnesium.—Use for the preparation of *Sulphhydric Acid*, which see.

Magnesium Carbonate—Examination of Commercial Samples.—Frank Gibbs Ryan has assayed six samples of this salt prepared by different manufacturers. On boiling with 20 times their weight of water, filtering and evaporating, residues were left weighing .18, .26, .28, .40, .44, and .48 per cent. Magnesium oxide was estimated merely by ignition, carbon dioxide by hydrochloric acid in a Geissler's apparatus, and water by the difference. The results compared with the theoretical amounts according to the formula recognized by the United States Pharmacopœia are as follows:

	U. S. P.	Samples	1	2	3	4	5	6
MgO	41.32		41.85	44.65	43.25	43.45	41.00	41.30
C_2O	36.36		34.90	34.05	33.75	32.45	31.85	31.80
H_2O	22.32		23.25	23.30	21.00	24.10	27.15	26.90

—Amer. Jour. Pharm., Nov. 1884, 572.

ALUMINIUM.

Aluminium—Successful Method of Soldering.—Mr. Bourbouze has succeeded in soldering aluminium, an operation which has hitherto been unsuccessful. He uses alloys of tin and zinc, tin, bismuth and aluminium, and tin and aluminium alone, the latter giving the best results. The proportions vary with the kind of work it is intended for. For instruments which have to be turned or shaped, 45 tin to 10 aluminium is most suitable. This will resist even hammering. Metal which it is desirable to solder to aluminium should be first tinned with pure tin.—Compt. Rend., xcviii., 1490; Phar. Jour. and Trans., Aug. 2, 1884, 81.

Burnt Alum—Identification.—Since burnt alum requires considerable time for solution in water, and it may be sometimes desirable to be able to identify it at once, Dr. Vulpius recommends the use of a solution of potassa as a solvent. A small quantity of the salt is shaken with the reagent, which dissolves it at once; on subsequent addition of an excess of chloride of ammonium, a white, gelatinous precipitate is produced.—Amer. Drug., July 1884, 123, from Pharm. Zeit.

MANGANUM.

Manganese—Occurrence in Plants, etc.—Mr. Maumené, in the course of a long series of experiments made on the existence of manganese in plants, has found that it is present in wheat, rye, rice, barley, potatoes, beet, carrot, cocoa, coffee, tea and tobacco. He finds that it is not always in the blood; that there is very little in milk, and but little in the urine, bones and hair, but a considerable quantity in fecal matters.—Rép. de Pharm., Dec. 1884, 554; Phar. Jour. and Trans., Dec. 1884, 504.

Permanganate of Potassium—Sensitiveness Towards Sunlight.—A. Reissmann has observed that the dry crystals of permanganate of potassium when exposed for some time to light, suffer a change in the surfaces thus exposed, the superficial layer being reduced to hydrated manganic peroxide. On dissolving the crystals in water, this external layer, which still possesses the form of the crystalline sides, remains behind as a shining sediment. The author concludes from this that solutions of permanganate suffer the same change along the sides of the vessels which are exposed to light. and that this change may be avoided by keeping the solution in the dark.

That the last-mentioned method of keeping permanganate solution conduces to its stability, has been observed before, although an absolute stability has probably never been attained.—Amer. Drug., April 1885, 75; from Zeitsch. f. Anal. Chem., 1885, 84.

Permanganate of Barium—New Method of Preparation.—All attempts to obtain barium permanganate directly from manganic peroxide and barium salts have failed; but a satisfactory method was found by G. Rousseau and B. Bruneau, in the decomposition of potassium permanganate by hydrofluosilicic acid, using the latter in slight excess. The mixture is kept cool, and after the separation of the potassium fluosilicate, the clear supernatant liquor is decanted, and the deposit drained on an asbestos filter and washed. The solution containing permanganic and hydrofluosilicic acids, is saturated in the cold with barium hydroxide. The solution of barium permanganate, after separation of the insoluble barium fluosilicate, is evaporated until the salt crystallizes out on cooling. The crystals may be obtained in very large orthorhombic octahedra, almost black, with a violet reflection.—Amer. Drug,, Dec. 1884, 252; from Compt. Rend. and Jour. Chem. Soc.

FERRUM.

Ferric Hydroxide—Colloidal Derivatives.—According to Mr. E. Grimaux, when potassium hydroxide is added to a mixture of glycerol and ferric chloride, a precipitate is formed soluble in excess, and the solution has the characteristic properties of the colloidal solutions previously described (coagulation, etc). The tendency to coagulate is diminished by the presence of a large amount of glycerol, and increased by the presence of sodium chloride or of potash in excess. If the proportion of glycerol is very large, coagulation is entirely prevented. When solutions rich in glycerol are dialysed, they first lose their excess of potash, then their excess of glycerol, and become coagulable by heat, and finally they form a firm, thick jelly containing glycerol, ferric hydroxide, and potash. Similar solutions are obtained by substituting either ammonia or soda, or sodium or potassium carbonate for potash. They seem to be compounds of glycerol, ferric hydroxide, and alkalies, and are easily dissociated by water into glycerol and insoluble compounds richer in ferric hydroxide. With acetic acid, they yield a precipitate soluble in excess, and this solution gives a greenish precipitate with potassium ferrocyanide, converted into Prussian blue by the action of a mineral acid.

Mannitol, erythrol, and sugar yield solutions having precisely similar properties.

Colloidal solutions are also formed by ferro-potassium tartrate, possessing similar properties. Colloidal compounds of arsenic and arsenious acid, boric acid, phosphate of sodium, and silica with ferric hydroxide, are also described.—Amer. Jour. Phar., Jan. 1885, 45–46; Compt. Rend., xcviii., 1485–1488, and 1540–1542.

Ferric Salts—Decolorizing Action on Indigo, which see under "Organic Chemistry."

Scaled Iron Salts—Practical Notes.—Mr. C. N. Lake has contributed a thesis to the School of Pharmacy of the University of Michigan, in which he gives the results of his experience in the preparation of the scaled iron salts of the U. S. Pharmacopœia. The preparations discussed are the pyrophosphate, phosphate, ammonio-tartrate, ammonio-citrate, and the ordinary and the soluble iron and quinine citrates. The paper will be consulted with interest.—See Amer. Drug. Circ., July 1884, 100.

NICKEL.

Nickel—Assay in Coins.—Mr. W. Chandler Roberts draws attention to the following method for the assay of nickel coins, adopted at the British mint, which has given very accurate results: Half a gram of the alloy is dissolved in as small a quantity of nitric acid as possible. About 1½ grams of strong sulphuric acid is then added, and the solution is evaporated to dryness to expel the nitric acid. The residue is then dissolved and diluted to about 60 cc., and is introduced into a platinum dish, which is placed in connection with the zinc pole of the battery and thus forms a negative electrode. Two "gravity" cells, each of the capacity of two pints, answer very well. The positive electrode consists of a flattened spiral of platinum wire suspended in the center of the solution in the platinum dish. The solution must be distinctly acid, for, if it is neutral, some nickel will be precipitated. The *copper* will be entirely deposited at the end of twelve hours, and is washed, dried and weighed with the usual precautions. The solution, together with the water used to wash the copper, is now heated, ammonia is added, and any *iron* which may be deposited is removed by filtration and weighed. The solution is then evaporated to the volume of about 60 cc., and is introduced into a platinum dish arranged as has been already described. The solution is, however, in this case ammoniacal, and three battery cells are used instead of two. It is necessary to insure that nitrates are only present in the solution in the smallest possible quantity. The metallic *nickel* should form a white coherent layer free from dark spots, and, after washing with water and with alcohol, is dried and weighed.—Phar. Jour. and Trans., June 27, 1885, 1072.

ZINCUM.

Zinc—Rapid Elimination of Arsenic.—Mr. L'Hote states that arsenic can be rapidly eliminated from zinc by throwing 1 to 1½ per cent. of chloride of magnesium into the melted metal, and agitating. Whitish fumes of chloride of magnesium are evolved, which carry with them the arsenic. Upon then pouring the metal into cold water granulated zinc is obtained, completely free from arsenic.—Phar. Jour. and Trans., Nov. 29, 1884, 423; Jour. de Phar. (5), x., 254.

Zinc—Action on Chloral Hydrate, which see under "Organic Chemistry."

CUPRUM.

Copper—Occurrence in Pharmaceutical Preparations.—Mr. John R. Hill has examined various preparations, and, with few exceptions, found them to contain perceptible quantities of copper; ergotin, infus. rosae acid. conc., and infus. chirettæ contained it in abundance. Very distinct reactions were obtained in extract. cinchonæ liquid., infus. cuspariae; distinct reactions were found in the infusions of cinchonæ conc., digitalis conc., senegæ conc., and serpentariæ, the decoctions of sarsæ conc. and of pareiræ conc., and in liquid extract of ergot. Less distinct reactions were obtained in the infusions of gentianæ conc., cascarillæ and columbæ, in the liquid extracts of sarsaparilla, taraxacum and senna, and in decoct. scoparii conc. In infusion of uva ursi it was just perceptible, while infusion of quassia was free from it. The latter was free from copper even when prepared in a copper vessel. The author finds that the preparations from drugs containing principles belonging to the tannin group are most liable to contamination. This contamination takes place mainly at the surface margin, where the liquid, the metal and the atmosphere meet. Vessels which are partly constructed of copper, so that the surface of the latter may not be exposed to the air and liquid at the same time, may therefore be used with impunity, but enamelled iron vessels or block tin and porcelain vessels are always to be preferred. —Yearbook of Pharm., 1884, 586–590.

Copper—Presence in Extract of Cannabis Indica, which see under "Pharmacy."

Copper—Removal from Extracts, etc.—Mr. G. Nattier proposes to remove the copper which may exist in extracts or other preparation, by the well-known method of electrolysis. The preparation must of course be sufficiently diluted, otherwise the current will not be able to accomplish the object. A feeble current only should be passed; the negative pole, where the dissolved copper will be deposited, should have a large surface, and may itself be of bright copper.

When thus operating, the current must not be interrupted while the negative pole is lifted out of the liquid, otherwise a portion of the copper might be re-dissolved.—Amer. Drug., Jan. 1885, 4.

Alkaline Solution of Copper—Observation in Relation to Glucose.—Mr. E. J. Maumené has made a remarkable observation on the effect which the use of either potassa or soda in the preparation of the well-known reagent for glucose exercises upon its efficiency.

Maumené first gives a synopsis of the various solutions that have been proposed, or are in use, namely those of Barreswil, Fehling, Boussingault, Pasteur and Maumené. The latter is composed of 41.67 parts of sulphate of copper, 16.67 of tartaric acid, 8.7 of potassa, and 27.6 of soda, made up with water to 1,000 cc. This solution does not produce any reaction whatever with glucose, even at the boiling point of water, unless another equivalent of potassa is added.

Wishing now to ascertain what difference there would be between solutions made with either potassa or soda exclusively, he prepared first a test liquid with potash as follows:

Sulphate copper	41.67 gm.
Bitartrate potassium	28.89 gm.
Caustic potassa (K_2O)	10.44 gm.
Water to make	1000 cc.

This liquid has a handsome sky-blue color, and acts upon glucose in the usual manner.

On now substituting an equal quantity of pure soda for the potassa, the liquid ceases to react with glucose. It has a more intensely blue color than the potassic liquid.—Amer. Drug., June 1885, 113, from Compt. Rend., vol. c., 803.

TITANIUM.

Carbonate of Titanium (so-called)—Composition.—Dr. A. B. Lyons has examined an article which has been supplied under the name of *carbonate of titanium*, and finds it to be composed as follows:

Ferrous sulphate (cryst.)	54.8
Ferric oxide (anhydrous)	40.5
Salts of calcium, potassium and sodium	2.2
Titanic acid and silica	1.0
Organic matter and loss	1.5
	100.0

The organic matter contained a vegetable alkaloid which proved to be sanguinarine. Practically, the powder consisted of a mixture of nearly equal parts of sub-carbonate of iron and sulphate of iron, partially exsiccated, with addition of an insignificant quantity of bloodroot.—Amer. Jour. Phar., Mar. 1885, 130, from Jour. Am. Med. Assoc., Nov. 29, 1884.

BISMUTHUM.

Bismuth—Atomic Weight.—Up to the year 1851, the atomic weight of bismuth was assumed to be 213, which figure was derived from experiments made by Lagerhjelm. In 1859, Dumas obtained, as the mean of very careful experiments, the value 210.46, since which time the figure 210 was generally adopted as the atomic weight (so also in the last U. S. Pharm.). In 1883, Marignac re-examined the subject with great care and minuteness, and obtained as a mean result (which he, however, himself declares to be not quite exact enough) the value 208.6. Finally Löwe as well as Schneider have recently obtained figures very close to 208. Hence it may be concluded that the latter is much nearer to the truth than 210.—Amer. Drug., Mar. 1885, 49.

Subnitrate of Bismuth—Use as a Surgical Dressing.—Dr. J. F. Morse regards this salt an excellent surgical dressing, which produces a peculiar change in the difference of the granulations filling a wound, and in the secretions which escape from the wound, provided it be a fresh one.—Amer. Jour. Phar., Nov. 1884, 598, from Western Lancet.

Bismuth Salicylate—Variability of the Commercial Article.—See under "*Salicylic Acid.*"

ARSENICUM.

Arsenic.—Method of Securing Absence from Sulphuretted Hydrogen, which see.

Arsenic—Elimination from Zinc, which see.

Arsenic—Value of Marsh's Method, etc.—See under "Hydrogen."

Arsenious Acid—Action upon Glycerin.—Mr. Herbert Jackson calls attention to the reaction which occurs when glycerin is saturated with arsenious acid. Several text-books mention the fact that glycerin is its best solvent, but the reason for this seems never to have been pointed out. Mr. Jackson observed that a considerable quantity of water was given off when anhydrous glycerin was treated with arsenious acid, and proceeded to determine the amount of water so evolved when a weighed quantity of glycerin was treated with an excess of the arsenious acid. 1.5 parts of the acid and 1 part of glycerin were used, and the mean of several experiments showed that an amount of arsenious acid, equal at least in weight to the glycerin, was necessary. Experiments to determine the maximum quantity of the acid which could be made to combine, consisted in inclosing different proportions of the substances in sealed, stout glass tubes, and heating them for two hours at 250° C. In all cases where the arsenious acid was in excess of the proportion above mentioned, some of it crystallized and some blackening of the contents of the tube occurred, owing to the reduction of arsenic. Further experiments showed that 14.45 grammes of glycerin required for saturation 15.98 grammes of arsenious acid, and give off 4.57 grammes of water. In other words, 184 parts (2 equivalents) of glycerin required 198 parts (1 equivalent) of the acid, and evolve 54 parts (3 equivalents) of water. The experiments further showed that arsenious acid and glycerin react to form normal glyceryl arsenite, or arsenious ether of glycerin, a compound which is a colorless, transparent, vitreous solid; very deliquescent, and easily decomposed by water into glycerin and arsenious acid. It is entirely soluble in absolute alcohol, and is left unchanged when the alcohol is driven off by evaporation. It is also freely soluble in glycerin, as would be expected. It becomes soft at 100° C., and can be poured easily when the temperature reaches 100° C. When quite dry, it appears to be stable at the boiling point of glycerin (290° C.) but is decomposed above that temperature.—Amer. Drug., Nov. 1884, 216; from Chem. News.

HYDRARGYRUM.

Mercurial Preparations—Presence and Determination of Mercurous and Mercuric Oxide.—Messrs. M. Dechan and T. Maben have communicated to the British Pharmaceutical Conference a paper in which they give the results of their examination of commercial specimens of *hydrargyrum cum creta*, *pilula hydrargyri* and *unguentum hydargyri*. Twelve samples of *hydrargyrum cum creta* contained respectively 22.05, 30.6, 30.75, 30.6, 34.05, 34.4, 32.62, 30.3, 49.6, 31.17, 21.2, and 35.8 per cent. of metallic mercury; four contained only traces of mercurous oxide, whilst the other contained quantities ranging from 0.1 to 6.15 per cent. They all contained mercuric oxide, the quantities ranging from 0.65 to 4.67 per cent. The authors account for the great mercurial strength of some of the samples by the hypothesis that the mercury, owing to its very high sp. gr. had fallen to the bottom of the bottle. If this hypothesis is correct, they might with equal justice attribute the lesser strength observed to the same cause, which, however, they fail to do. Eight specimens of *pilula hydrargyri* were examined, and found to contain 37.1, 33.6, 31.46, 41.33, 33.62, 28.45, 35.0, and 31.5 per cent. of mercury respectively. Six of these specimens were quite free from either mercurous or mercuric oxide, one contained traces of both, and one contained 1.32 per cent. of mercurous oxide. Eight samples of *ung. hydrarg. fort.* and four samples of ung. hydrarg. mit. were found to contain 38.0, 39 0, 40.31, 40 14, 44.0, 44.5, —13.5, 13.48, 10 0 and 10.5 per cent. of mercury. Two contained traces of oxide, three contained traces of oleate, and one contained 0.6 per cent. mercuric oxide combined with fatty acid. The author's method for determining the oxides depended upon their extraction with acetic acid, treatment of the acetic solution with hydrochloric acid, whereby the mercurous oxide is precipitated, and treatment of the filtrate with sulphhydric acid to separate mercuric oxide. The process requires slight modification to accommodate it to the different preparations.—Yearbook of Pharm., 1884, 556–563.

Referring to the above paper, Mr. Harold Senier remarks that the results obtained by Messrs. Dechan and Maben are so materially opposed to those previously obtained by him (see Proceedings 1876, 92), that they indicate an error in the method or experiment either on the one side or the other. He had employed a method which is based upon some observation of Scheele on the action of hydrocyanic acid on mercury, which may be concisely stated as follows: The sample is digested in hydrochloric acid to dissolve the mercuric oxide; to this solution, after neutralizing excess of acid with ammonia, stannous chloride is added, and the reduced metallic mercury separated, dried over sulphuric acid, and weighed; from this weight is calculated the amount of mercuric oxide present. To estimate the mercurous oxide, a fresh portion of the sample is digested in a 5 per cent. solution of hydrocyanic acid, which converts the mercury of the mercuric oxide, into mercuric cyanide, and also so converts half the mercury of the mercurous oxide, leaving the remainder as metallic mercury. The hydrocyanic acid solution is treated with stannous chloride, in the same manner as the hydrochloric acid solution, and from the weight of metallic mercury obtained, the weight of mercury existing as mercuric oxide is subtracted, and the remainder doubled; this result calculated into mercurous oxide gives the quantity present in the sample.

The author has since made comparative experiments with both methods, and concludes that the method of Messrs. Dechan and Maben is faulty. The source of error in the latter process is principally the instability of the mercurous acetate in the presence of organic matter, especially glucose, it being rapidly reduced, even at ordinary temperatures to oxide. On this account the results of Messrs. Dechan and Maben, obtained with hydrargyrum cum creta, a preparation free from organic matter, agree very closely with his, whilst they totally differ in the case of pilula hydrargyri. To further prove the correctness of his issue, Senier added 5 per cent. of mercuric oxide to some freshly prepared pilula hydrargyi, and determined the amount of oxide by both methods. The results were:

Hydrocyanic acid method (Senier's)	4.72 p. c. Hg_2O.
Messrs. Dechan and Maben's method	.250 " "

Some samples of pilula hydrargyri, which had been examined in 1876, were again subjected to examination, and it was found that the properties of mercuric oxide had increased, from .24 to 1.20 per cent. in one instance, and from .62 to 3.62 per cent. in the other; thus affording another proof of the theory that the oxides of mercury, which undoubtedly exist in all samples of pilula hydrargyri, increase with the age of the sample.—Amer. Jour. Phar., Jan. 1885, 47–50; from Phar. Jour. and Trans., Nov. 8, 1884.

Mercurial Preparations—Manufactures on a Large Scale.—Mr. Ad. Sommer has communicated a valuable paper on the preparation of "mercurial ointment," "mercury with chalk" and "blue mass" to the Alumni Association of the California College of Pharmacy. The paper, which is of interest chiefly to manufacturers, is illustrated with the apparatus required in the various operations, and may be consulted in Amer. Drug., Mar. 1885, 42–44.

Mercuric Iodide—Solubility in Water and Alcohol.—Mr. E. Bourgoin has ascertained that biniodide of mercury is soluble in water at the rate of 4 centigrammes per liter (or 0.617 grain in 33⅞ fl. oz.), the solubility increasing with the temperature, and also by the addition of alcohol. One liter of alcohol of 80 per cent., dissolves 2.857 gm. (44 grains) of mercuric iodide, and one liter of absolute alcohol dissolves 11.86 gm. (184 grs.).—Amer. Drug., May 1885, 97; from Rép de Pharm.

Mercuric Oleate—Preparation.—See *Oleate of Mercury*, under "Organic Chemistry."

ARGENTUM.

Ammonia Chloride of Silver.—Application as a Test for Iodine, which see.

Silver Plating—Improved Process.—Ebermeyer dissolves 20 parts of silver in 60 parts of nitric acid, adds 20 parts of caustic potassa, 50 parts of distilled water, filters, and adds sufficient distilled water to 22° B. (sp. gr. 1.176). The objects are cleaned with alkali, etc., dried, warmed, and moved backward and forward in the solution; they are then dried with sawdust, and finished with precipitated chalk and chamois.—Amer. Jour. Phar., Jan. 1885, 26, from Pharm. Zeit. Russl., xxiii., p. 405.

OSMIUM.

Osmic Acid—Hypodermic Use.—A. Eulenburg reports on twelve cases of hypodermic injection of osmic acid. The amount he injects at a time is 0.05 gram. The solution used is never greater than one per cent., but the dose is repeated sometimes as often as fourteen times. It is desirable to pass the injection as nearly as possible in the immediate neighborhood of the affected nerve. Of the twelve cases of different forms of neuralgia, three were cured, four improved. The other cases were of long standing and were not improved.—Amer. Jour. Phar., Dec. 1884, 645; from Weekly Med. Review, September 20, 1884.

NEW METALS.

Idunium—A New Metal.—Prof. Websky reports the discovery of a new metal, to which he has given the name of *idunium*, in vanadate of lead. It resembles vanadium in several respects, and the only oxide hitherto examined appears to possess acid properties and forms stable salts with bases. Its formula will probably be Id_2O_5, as its general characteristics and reactions correspond to those of vanadic acid.—Scient. Amer., Dec. 6, 1884, 353; Phar. Jour. and Trans., Dec. 27, 1884, 512.

ORGANIC CHEMISTRY.

HYDROCARBONS.

(Including Volatile Oils.)

Rhigolene—Useful Compounds.—Dr. Richardson, in a previous paper, had pointed out that rhigolene has no local anæsthetic properties except by the cold it produces on evaporation. He now draws attention to some useful compounds of that body. Camphor and spermaceti dissolve in it freely, and a solution made by dissolving one drachm of each in two fluidounces of rhigolene may be applied on cotton-wool to burns. The evaporation of the liquid is said to induce instant relief from pain, and there is left a thin film of camphor and spermaceti covering the injured surface. A solution of 5 grains of iodine in one fluidounce of rhigolene affords a means of depositing iodine in minute divisions on the surface of a fetid wound. Further, an ammoniated solution which acts as an antiseptic for inhalation, is prepared by shaking rhigolene with a strong solution of ammonia, and decanting after separation. Natural history specimens and similar objects may be preserved by steeping them in a rhigolene solution of camphor, the camphor being left in the tissues upon the evaporation of the more volatile constituent.—Phar. Jour. and Trans., May 2, 1885, 889; "The Asclepiad," vi., 168.

Paraffin Oil— Practical Uses.—Leon Crismer gives an interesting account of the uses to which paraffin oil may be put as a solvent and reagent.

Test for Water in Ether, etc.—Liquid paraffin dissolves in all proportions in anhydrous chloroform or ether, yielding clear solutions; but in the presence of water or of diluted alcohol the solutions are turbid. Liquid paraffin dissolves sparingly in absolute alcohol; such a solution at once becomes turbid on the addition of weaker alcohol. Methyl alcohol has a very similar behavior with paraffin oil. The presence of water in the liquids named may thus be readily ascertained.

Solvent Properties.—Liquid paraffin is a good solvent for amyl alcohol, crude fusel oil, chlorine, bromine, iodine and the phosphorus and alkyl compounds of the halogens. White phosphorus kept under paraffin oil unites readily and without danger of explosion with bromine dropped into the liquid, the mixture being kept cool; the phosphorus tri-bromide dissolved in the liquid paraffin, is decomposed on dropping in water.

Hydrobromic acid being given off, and may be completely dehydrated by passing the gas over phosphoric anhydride.

Hydriodic acid may be prepared in a similar manner. The iodine is added in small quantities to the phosphorus kept under liquid paraffin; water is added, and the mixture is finally heated in a sand-bath.

Ethyl iodide is expeditiously prepared using liquid paraffin as a solvent for the phosphorus teriodide, adding the alcohol gradually, returning the ether by means of a reversed cooler to the mixture and finally distilling. 13 gm. phosphorus, 160 iodine and 60 absolute alcohol yielded 190 gm. colorless ethyl iodide, which after treatment with a little iodine, sodium, and finally with calcium chloride, furnished 182 gm. ethyl iodide, sp. gr. 1 944 at 15° C., and boiling at 72.5° C.

Methyl iodide was prepared in the same way; the yield was 90 per cent. —Amer. Jour. Phar., Mar. 1885, 151; from Berichte D. Chem. Ges. 1884, 649–652.

Naphthalin—Medicinal Uses.—Professor Rossbach has observed that in all catarrhal conditions of the intestines, and in chronic intestinal affections, naphthalin is a specific, and invariably causes the disappearance of the malady. He never noticed any bad or after-effect, and most of the naphthalin passed off again by the bowels, while a small percentage of it, changed to phenol, made its appearance in the urine. The usual dose for adults is from eight to ten grains daily. The remedy has also a very favorable influence upon vesical catarrh, the purulent discharge at once ceasing, and he attributes its beneficial effect in such cases to the changing of naphthalin to phenol in the urine. Patients generally do not object to the taste of naphthalin, purified by sublimation; as a corrigens for its odor, a few drops of oil of bergamot is recommended.—Amer. Jour. Phar., Dec. 1884, 645; from Deutsch. Med. Zeit.

Formene (*Marsh Gas*).—*Use for the Liquefaction of Oxygen*, which see under "Inorganic Chemistry."

Essential Oils—Identity of Differently Named Constituents.—Mr. Wallach has undertaken a series of investigations to determine, if possible, whether some of the differently-named constituents of essential oils are not identical with each other. He finds that cajeputol, the principal constituent of oil of cajeput, is identical with cyneol, the principal constituent of oil of wormseed (which see below). As cynin, the terpene from cyneol, possesses an odor of lemons, some experiments were also made as to its relationship towards the terpenes of oils from aurantiaceous plants. The results incline the author to the belief that there is a close relationship, though not identity, between these different terpenes.—Liebig's Annal., ccxxv., 314; Phar. Jour. and Trans., Nov. 1, 1884, 342.

Volatile Oils—Estimation of Minute Quantities.—In estimating the quantity of volatile oil yielded in the distillation of vegetable substances difficulty is frequently met with in consequence of the small quantity of material, and the readiness with which it disappears during the operation. According to Mr. Levallois an approximate titration may be made by means of bromine, which upon being added to water or alcohol holding volatile oil in suspension is decolorized until a certain point is reached at which the yellow tinge remains permanent after stirring, and all the odor of the volatile oil has disappeared. It is desirable for this purpose that the oil should be contained in a relatively small quantity of water or alcohol, which would in most cases necessitate redistillation; but Mr. Levallois points out that under suitable arrangements the whole of the essential oil is carried over with the first portion of the distillate. The oils experimented upon were those of orange flowers, orange peel, rose petals, anise, pelargonium, lavender, cumin, eucalyptus, and others, but nothing is said as to the quantity of bromine that each or all are capable of decolorizing. In the presence of water an additional indication that the limit of extraction is reached is given by the sudden appearance of a whitish resinous looking insoluble matter that coats the sides of the containing vessel upon agitation. Compt. Rend., xcix., 977; Phar. Jour. and Trans.. Dec. 27, 1884, 502.

Essential Oils and Perfumes—Production in Grasse.—Professor F. A. Flückiger communicates a very exhaustive paper on the essential oil industry in Grasse, from which brief extracts only can find place. Reference may be had to the original paper in "Archiv. der Pharmacie" (xxii., 473), or to the very thorough abstract from Pharm. Jour. and Trans. (Dec. 13, 1884, 488), in Amer. Jour. Phar., Mar. 1885, 131–139. Essential oils are obtained from plants which grow wild or are cultivated at and in the neighborhood of Grasse. Among the former are named *Lavandula Spica*, Chaix (*L. latifolia*, Villars); *Lavandula vera*, D. C. (*L. officinalis*, Chaix, *L. angustifolia*, Mœnch); *Thymus vulgaris*, L.; and *Rosmarinus officinalis*, L. The oil of these four labiates constitutes an important export industry of Grasse. The plants being vigorous, persistent bushes, they require no cultivation, as the tops, bearing leaves and flowers, taken for distillation, are always replaced, even though the collector does his work in a most unskilful manner. The large distilleries in Grasse conclude arrangements with the communities in the districts round about, by which they become entitled to the produce of large tracts of land. The work itself is done for the Grasse firms by the rural population, who set up their simple copper stills on the spot, and only carry the distillate to the city. Many of these traveling stills (*alembics voyageants*) are indeed the property of the large houses in Grasse. According to estimates furnished by Mr. Roure, proprietor of one of the largest manufactories, the following quantities of each oil are delivered in Grasse every year: from *Lavandula vera*, 80,000 to 100,000 kilograms; from *Thymus vulgaris*, 40,000; from *Lavandula Spica*, 20,000 to 25,000; from rosemary an equal quantity. The quantity sent out from Grasse probably covers the requirements of the whole world; at least the author only knows of rosemary that it is cultivated also in Dalmatia, which country sends about 20,000 kilos. of the essential oil into the market.

Of the oils which, unlike those already mentioned, are regularly distilled in the laboratories of the Grasse manufactories, those of species of *Citrus* must be named, and especially oil of neroli. The flowers of the bigarade tree (*Citrus vulgaris*, Risso) are not submitted to distillation for the oil, of which they yield at most one part from one thousand parts, but for the production of the thousands of hectolitres of "eau de fleurs d'oranger," ("aqua florum aurantii," and "aqua naphæ,") upon which Grasse prides itself; the oil of neroli is a by-product, though of course very costly. According to the author's informants, about 2,000 kilograms of this beautiful oil is prepared in Grasse yearly, but nominally much more is exported. When a proper price is paid, a pure oil of neroli may be obtained; but the perfumers and druggists require it at reduced prices. In order, therefore, to accommodate them the producers add some "essence de petit grain," which, however, is no longer distilled from "petit grain," *i. e.*, the small unripe fruit of the bigarade tree, but from its leaves. No other species or form, however, of the genus *Citrus* is endowed with so fine an aroma in the leaves as the bitter-fruited orange tree, the "bigaradier." The blossoms of the ordinary sweet-fruited orange, which are not used for distillation, yield only an oil of inferior value. In competition with the products of the bigaradier, the sweet orange which is cultivated in Grasse is disappearing. Neither the bergamot nor the lemon occur there.

Rose-water is distilled in enormous quantities, a very small quantity of oil of rose being also collected. The latter, however, contains far more of the worthless solid constituent, dissolved in the liquid portion, than does the oil from the Balkans or from India.

Orris Root Camphor ("beurre d'iris") is produced to the amount of four to ten kilograms yearly at the establishment of Mr. Roune, about one part being obtained from 1,000 parts of orris root. It is valued at 1,500 to 1,800 francs per kilo. The manufacturers draw their supplies of raw material from Florence and Verona.

The material for the production of "pommades" and "extracts" is confined to eight plants, viz: Bigarade orange flowers, roses, cassie (*Acacia Farnesiana*, Willd.), jasmin (*Jasminum officinale*, L.—this being advantageously grafted with *J. grandiflorum*, L.), the jonquilla (*Narcissus Jonquilla*, L.), reseda (*Reseda odorata*), tuberose (*Polianthes tuberosa*, L.), and violet (*Viola odorata*). The author gives some general information in reference to the methods for the extraction of the odor, which is in the main well understood. An interesting point worth noting is that trials have been made to substitute paraffin bodies for fats, on account of the liability of the latter to become rancid. It has been found, however, that the inapplicability of paraffin for the purpose of "infusion" and "enfleurage" is so decided that even the addition of it to fat in the preparation of "pommades" by these methods has proved injurious.

Anhydrous Volatile Oils—Preparation and Characters.—Mr. John Williams, having occasion to prepare some anhydrous volatile oils, if possible in a colorless condition, for certain optical experiments, incidentally made some observations of interest from a pharmaceutical point of view, which he now records in a paper to the British Pharmacopœial Conference. The oils operated on were the volatile oils of orange, lemon, bergamot, origanum, geranium, lavender, and peppermint, all of which were of reliable source and quality. The ordinary process of distillation, in the presence of water, being excluded, and the application of direct heat being accompanied by too much risk, the author had recurrence to a bath of fusible metal—an alloy of bismuth, cadmium, tin, and lead, fusing at 140° F. Into the fused metal, at this temperature, the retort may be placed without danger of cracking. The neck of the retort is caused to extend some two or three inches into a somewhat larger tube two or three feet in length, this being all the condenser required, since the boiling point of the oils is high, varying from 320° F. to 464° F., while their vapors are so easily condensible that no water is required for their condensation. A little soft paper wrapped around the joint of the retort and tube is sufficient to keep in the vapor of the oil. When heat is applied, there first comes over a mixture of aqueous vapor and oil; after a time the neck of the retort is seen to clear from streaks and striæ, and the boiling point rises somewhat. It is then necessary to change the receiver, when a considerable amount of anhydrous oil distills over, generally amounting to quite one-half, frequently more, of the oil operated upon. The first portion, containing the aqueous vapor, amounts to not more than $\frac{1}{30}$th to $\frac{1}{16}$th of the crude oil, and, while of pleasant flavor, can easily be distinguished from the true oil. The second portion—the anhydrous oil—distills over during a constant rise of temperature, and its collection is continued until the boiling point is observed to rise more rapidly, when the receiver is again changed. A colored oil, comparatively small in quantity, now passes over, and is collected until, at the high temperature employed—reaching 464° F., or upwards—the oil begins to come over very slowly. The residue in the retort consists of very curious and interesting resinous or oleo-resinous bodies, probably the products of oxidations of the natural oils, their quantities varying very much with different oils, but being always very large. In most instances, this residue, which the author believes to be unchanged as it originally existed in the oil, has an offensive smell, and to the extent of this must modify the true odor of the oil, as represented by the anhydrous fraction.

In order to obtain the anhydrous portions colorless, it was found necessary to redistill them. With one exception they were obtained colorless by this means, a small portion of hydrated oil passing over first, and a small quantity of resinous residue remaining in the retort.

Oil of Orange yielded a large quantity of pure anhydrous oil, but little of higher boiling point, and a brown oily residue, not so offensive as some of the others.

Oil of Lemon yielded a large quantity of anhydrous oil. The residue was dark brown, and solid, but not offensive in smell.

Oil of Bergamot yielded a larger quantity of pure oil. The high boiling oil was colored and not pleasant. The residue was very dark colored, but liquid, and very offensive in smell.

Oil of Origanum yielded a large quantity of pure oil. The residual oil was very dark colored, more liquid than the bergamot, but not so offensive in smell.

Oil of Geranium yielded a comparatively small quantity of pure anhydrous oil, still colored; the high boiling oil was in small quantity and not nice. The residual oil amounted to quite one-half the original oil; it was very dark colored and very offensive.

Oil of Lavender (American?) yielded a smaller quantity of anhydrous oil than some of the others. The high boiling oil was very much colored, and not of pleasant flavor. The residual matter was nearly black, of the consistence of treacle, and very offensive.

Oil of Peppermint (American) yielded about the same proportion of pure anhydrous oil as the oil of lavender. The high boiling oil was still distinctly peppermint, but coarse in flavor. The residual oil was light brown and thick; it was not so offensive as some of the other residues, but was very inferior to ordinary oil of peppermint in flavor. While the flavor of the anhydrous oils will strike most persons as not being so strong as that of the original oils, it is far more delicate; having been deprived of their coarse and bad smelling, though probably more powerful fractions.—Yearbook of Phar., 1884, 528–532.

Pungent Principles of Plants.—Mr. J. C. Thresh having for the present abandoned his investigations of the pungent principles of plants, on account of the great difficulties and time consumed by such investigations, communicates a *résumé* of the results obtained during the past three years. The pungent principles were reported to constitute a class of bodies destitute of odor, possessing a fiercely burning taste, and are neither bitter, nauseous, nor acid. The best known drugs containing such principles are Cayenne pods (*capsaicin*), the rhizomes of ginger (*gingerol*), and galangal (*alpinol*), the peppers, and grains of paradise (*paradol*). At present capsaicin is the only one of these principles that has been obtained in a crystalline condition, but it is quite possible that the other principles are also crystallizable substances which have hitherto, from the presence of some trace of impurity, resisted all efforts to obtain them in crystalline form.

In the plants examined by the author, the pungent matters are all found to possess the following characters in common:

Readily soluble in 50 per cent. alcohol, ether, chloroform, benzol, carbon disulphide, turpentine, acetic acid, and dilute solution of potash. Slight solubility in cold petroleum ether.

Insolubility in solutions of ammonia and of alkaline carbonates.

Ready destructibility when treated with oxidizing agents. With moderately strong nitric acid, much carbonic acid is evolved, and oxalic and succinic acids are formed, a complex mixture of resins and one or more acids of the fatty series. Oxidized with alkaline permanganate, oxalic acid is formed in abundance, the only other product (in cases examined, gingerol and paradol) being a caproic acid, $C_6H_{12}O_2$. Warmed with acid permanganate, CO_2 is evolved with brisk effervescence. Warmed with chromic acid mixture, two-thirds of the carbon is given off as CO_2 and fatty acids, and the remainder as a volatile neutral substance, which resists further treatment with the oxidizing agent.

All have a density only slightly exceeding that of water. Gingerol and paradol, when carefully heated, begin to decompose at a temperature of a little over 100° C, becoming darker in color and evolving an inflammable gas, and from 2 to 3 per cent. of a colorless, limpid liquid distills. The temperature rises rapidly to about 182° C, when about 5 per cent. of a yellowish, less limpid distillate is collected. The temperature then goes on increasing until too high for the mercurial thermometer to register, when about 40 per cent. of a thick, reddish-colored oil condenses. The residue in the retort is solid when cold, of empyreumatic odor, and pitchy appearance. Ultimate analysis leads to the formula $C_9H_{14}O_2$ for capsaicin, and it seems probable that gingerol and paradol have an isomeric composition. The pungent principle of the fruits of *Piper nigrum* has not been satisfactorily isolated, but very probably is allied to gingerol and the pungent principles just considered. Alpinol belongs to the same group of bodies as gingerol and paradol.—Yearbook of Pharmacy, 516–523.

Galangol—Characters, etc.—See *Alpinia officinarum* (Hance) under "Materia Medica."

Terpin—Medicinal Use and Preparation.—Terpin has been recommended as an excellent expectorant in bronchitis, in doses of 0.2 to 0.4 gm. According to Fournie it is prepared as follows: A mixture of 4 liters of rectified oil of turpentine, 3 liters of alcohol (80°), and 1 liter of nitric acid, is placed in large shallow porcelain or glass vessels. The crystals which separate are collected, dried between folds of filtering paper, and again dissolved in 95 per cent. alcohol, which has been made alkaline so as to neutralize any adhering HNO_3, the solution is set aside in a cool place to crystallize. The yield is about 12 per cent. of the turpentine used.—Amer. Jour. Pharm., June 1885, 293; Lyon Méd.; Ph. Centralhalle, No. 17.

Oil of Limes—Distinction of Hand Made from Distilled Oil.—Mr. Francis Watts communicates the following character of distinction between "ecuelled" (hand made) and distilled oil of limes: Ecuelled oil is of a decidedly yellow color, varying in intensity, being darker in new specimens. The specific gravity also varies, being higher in new samples; the mean specific gravity of seven samples, all under twelve months old, being .8734. The following table gives a number of carefully determined specific gravities of various samples, all fairly new.

Temperature = 29° C. (84° F.)		Water at 4° C. = 1.0000.	
Age.	Sp. gr.	Age.	Sp. gr.
Under 24 hours	.8755	About 6 to 7 months	.8722
2 or 3 days	.8750	About 5 to 6 months	.8719
About 7 months	.8737	About 18 months	.8709
About 6 months	.8732		.8704
About 8 months	.8726	Distilled	.8554

Ecuelled oil may be regarded as an almost saturated solution of citropten, or lime camphor, and this may be made a means of distinction. The difference in flavor and aroma is so marked as to scarcely require any other means of distinguishing ecuelled from distilled oil, the ecuelled having a decided and fragrant lemon-like smell, whilst the distilled is very inferior, frequently possessing little more than the smell of turpentine. The distilled oil is usually almost colorless, is specifically lighter, of inferior aroma, and contains no citropten. When this citropten is treated with oxidizing agents, *e. g.*, nitric acid or preferably chromic acid and mixture, a red resinous acid body is produced (probably the limettic acid of Vohl). So that if a sample of oil of limes be agitated with chromic acid mixture for some few minutes and the mixture filtered, the red resin will be left on the filter and sides of the test tube, if the oil be hand made; but will not appear if simply distilled. When agitated with Nessler's test, ecuelled oils give pale yellow mixtures (apparently darker mixtures as the oil becomes older). Distilled oils, on the other hand, give dark grey and black mixtures, thus affording a marked distinction. Old resinized ecuelled oils, too, give dark greenish-grey mixtures. The author, therefore, believes that it would be possible to detect admixtures of from 5 to 10 per cent. of distilled oil by means of Nessler's test —Amer. Jour. Phar., Dec. 1884, 632–633; from Phar. Journ. and Trans., Oct. 1884, 322.

Natural Camphor Oils—Characters, etc.—Mr. Peter Macewan draws attention to the natural camphor oils, namely, those of *Dryobalanops aromatica* and *Camphora officinarum*, which are highly esteemed as remedial agents in the countries where they are produced, and seem destined to find a wider application in European countries.

Dryobalanops, or *Bornean Camphor Oil*, is a more simple body than laurel camphor oil, consisting chiefly of borneene, an isomer of turpentine, with a small quantity of resinous matter. Its sp. gr. is close upon 0.900. A sample of Johore oil, however, was found by the author to have a sp. gr. of 0.882. Two old samples of Bornean camphor oil, in the museum at Kew, had a sp. gr. of 0.894 and 0.909 respectively.

Laurel Camphor Oil has hitherto been chiefly derived from Formosa. A sample was found to have the sp. gr. of 0.943. This kind of camphor oil may be taken as a saturated oleaceous solution of camphor. No satisfactory chemical examinatian has as yet been made.

Japanese Camphor Oil, like that from Formosa, is a laurel camphor oil. Like the oil from the latter source it leaves on evaporation, on odor reminding of sassafras, but the odor is much stronger than that from Formosa oil, and is quite distinct in the crude oil before evaporation, the camphor odor being comparatively feeble. The feeble camphor odor is due to the absence of camphor, which is doubtless removed by the redistillation of the oil, to which, according to Mr. H. Oishi, it is subjected. According to the latter, the purified oil has a sp. gr. of 0.895, the crude, 0.959. Mr. Macewan's specimen has a sp gr. of 0.951, yet it is the purified article. He determined the absence of camphor in his specimen, but on distilling the oil he found that very little passed at 150° C., nearly one half required a temperature up to 205° C., and the residue was found to have a sp. gr. of 0.995. The Japanese oil, the author finds, differs from the Formosa oil in its behavior towards nitric acid. If half a drachm of B. P. acid be allowed to act upon a few drops of the Japanese oil for a minute, then diluted with half a drachm of water, a crimson color is imparted to the clear watery solution; but the Formosa oil so treated gives a milky solution, having a scarcely perceptible green shade. Hydrochloric acid acquires a salmon color with both, more marked, however, with Japanese oil.—Phar. Jour. and Trans., June 20, 1885, 1045, 1046.

Matico-Camphor—Characters.—A specimen of matico-camphor (from *Piper angustifolium*), has been examined by K. Kügler. It had the odor and taste of matico leaves, and melted between 89° and 103°. After repeated crystallizations, it melted at 94°, the mother-liquors containing a yellow amorphous resin. Matico-camphor exhibits a rotatory motion on the surface of water; it is not attacked by aqueous alkalies, is readily soluble in alcohol, ether, chloroform, benzin, and light petroleum. The pure substance lacks both taste and odor. In contact with hydrochloric acid it assumes an intense violet color, which changes to blue and then to green, the compound yielding brown crystals from ether, showing green fluorescence, and having an ethereal odor. With sulphuric acid, it becomes yellow, then red, and finally violet. With sulphuric and nitric acids, it assumes first a yellow, then a violet, and finally a blue color. Matico-camphor has the formula $C_{12}H_{20}O$; it is, perhaps, the ethyl-derivative of ordinary camphor.—Amer. Jour. Phar., Sept. 1884, 477, from Ber. d. D. Chem. Ges. [16], 2841–2843.

Menthol—Characters as Obtained from Oil of M. Piperita.—Prof. Henry Trimble reviews the chemical characters of menthol as given by different authors, and more particularly those of menthol from Japanese oil of peppermint, and communicates the results of his examination of a sample of menthol from *Mentha piperita*, furnished by Prof. Maisch, which he finds sufficiently different to warrant its special designation as

Pipmenthol.—The sample under examination had the characteristic odor of *M. piperita*, while the commercial menthol has a peculiar odor resembling a mixture of peppermint with other members of the mint family. The crystals are "snow-white and acicular," while those of commercial menthol are more or less transparent. Chemically the two are undoubtedly identical, as the following experiments will show:

Pipmenthol fused at 42° C.; several determinations confirmed this. The thermometer used was compared with a number of others and found to be accurate. Japanese menthol fused at 41°. Three combustions—one of pipmenthol and two of the Japanese—were made with the following results:

			Japanese.	
	Calculated for $C_{10}H_{20}O$.	Pipmenthol.	I.	II.
C.	76.92	77.14	79.63	79.33
H.	12.82	12.93	13.03	12.75
O.	10.26			
	100.00			

The difference in the amount of carbon in the Japanese is explained, as in the lower fusing point, by the presence of some of the liquid oil richer in carbon. This will also explain the low fusing-point given by the early investigators.

As found by Beckett and Wright, menthol, after exposure to air for some weeks, will have a higher fusing point, and, we may suppose, a lower carbon percentage. The pipmenthol, as now made, may properly be taken as a standard for the determination of the properties of this substance, and there is little doubt but that the Japanese article may be so purified as to resemble it in everything but odor.—Amer. Jour. Phar., Aug. 1884, 405–406.

Menthol—Detection of Admixture of Thymol.—Professor Eyckman recommends the following method for detecting thymol in menthol: Dissolve a little of the suspected menthol in 1 C.c. of glacial acetic acid, and add 5 to 6 drops of concentrated sulphuric acid. On now adding one drop of nitric acid a fine blue color will make its appearance (if thymol was present) in the lower part of the test-tube, which will spread throughout the contents of the latter on shaking. If only a small amount of thymol is present, the color will be dichroic, red by transmitted, and blue by reflected light. If phenol is present, a pure violet color only is produced. Salicylic acid, camphol, and borneol yield no color reaction under these circumstances.—Amer. Drug., Feb. 1885, 36; from Phar. Zeit.

Oil of Peppermint and Menthol—Use for the Relief of Burns, etc.—Dr. Brame states that oil of peppermint gives immediate relief of the pain in burns if applied after immersing the parts burned in water (*Lancet*). The itching of urticaria and mosquito bites is said to be much alleviated by the application of menthol.—Cinc. Lanc. and Clinic.; Amer. Jour. Phar., April 1885, 206.

Oil of Wormseed—Constituents.—Messrs. Wallach and Brass confirm the statements of previous observers, that the principal constituent of "oleum cinæ" is a compound having the composition $C_{10}H_{18}O$, which being an isomer of borneol, they propose to call

Cyneol.—This is accompanied by a certain quantity of hydrocarbons with a similar boiling point; but they have also met with another compound richer in oxygen, and having a higher boiling point. Pure cyneol is a liquid having a characteristic, but not disagreeable, camphor-like odor, boiling at 170° to 177° C., and has a sp. gr. of 0.92297 at 16° C. It is optically inactive, though the rectified oil from which it is obtained had been found to have a lævogyre rotation of 2.9°, due to other constituents boiling at higher temperatures. Oxidized by boiling with nitric acid, cyneol yielded besides the lower fatty acids, essentially oxalic acid, but no acid of the aromatic series, whilst the hydrocarbons accompanying it in the oil, yielded upon oxidation always more or less toluyilic or terephthalic acid. By treatment with gaseous hydrochloric acid, cyneol is converted into a hydrocarbon, $C_{10}H_{16}$—characterized by its readiness to form a tetrabrom compound—to which the authors have given the name "cynen."—Liebig Annal., ccxxv., 291; Phar. Jour. and Trans., Nov. 1884, 342.

Oil of Thyme—Physiological Action.—Camperdon ("Bull. gén. de thérapeut.) arrives at the following deductions: 1. In therapeutical doses (three to fifteen grains), oil of thyme causes mental excitement or stimulation; hence it is a valuable diffusible stimulant in depression following anæmia, in conditions of collapses, etc. 2. It is an active diaphoretic and diuretic. 3. From its direct action upon mucous surfaces it is to be recommended in catarrhal affections of the respiratory and genito-urinary tracts. 4. It is a prompt hemostatic. 5. Thyme possesses powerful antiseptic properties, and is well adapted for use in surgery. 6. It is recommended that the internal administration of the drug be supplemented by its employment in the form of baths, fumigations and inhalations.—Amer. Jour. Phar., April 1885, 206; New York Medical Journal.

Oil of Rose—Distillation in Germany.—The well-known essential oil firm, Schimmel & Co., in Leipzig, have undertaken to distil the oil from roses grown in Germany, and at their first venture obtained three kilos of oil. Its odor is stronger than that of the Turkish oil (chiefly, perhaps, because it is pure), and its freezing point higher. Turkish oil freeezes at 21° C., while the German freezes already at 32° C.—Amer. Jour. Phar., Jan. 1885, 27; from Rundschau-Leitmeritz, x., 676.

Oil of Rose—Test.—O. Helm, in "Archiv. d. Pharm.," 1885, p. 104, observes that the test with a mixture of 5 p. chloroform and 20 p. alcohol cannot be relied upon, as no separation of crystalline scales took place in four different rose oils, which were doubtless genuine. But Prof. Flückiger ("Archiv," p. 185) states that in an experience of many years it has never failed in his hands.—Amer. Jour. Phar., May 1885, 242.

Essential Oil of Saffron—Isolation and Character.—See *Crocus electus*, Gatinais, under "Materia Medica."

Eucalyptol—Characters.—According to C. Jahns, eucalyptol, from *Eucalyptus globulus*, has the formula, $C_{10}H_{18}O$, boils between 176–177° C., has the sp. gr. .923 at 16° C., is without optic action, and is identical with cajuputol, as it shows the same chemical and physical properties.

He corroborates the observation of Faust and Homayer (1874), that the eucalyptol of Cloëz was a mixture, and shows that *Eucalyptolum purissimum* of commerce is merely rectified oil of eucalyptus.—Amer. Jour. Pharm., May 1885, 237; Arch. d. Pharm., January 1885.

Shikimen and Shikimol.—Two constituents of the volatile oil of the leaves of *Illicium religiosum*, which see under "Materia Medica."

Oil of Gaultheria—Value in Rheumatism.—Dr. H. H. Seelye reports the results obtained from oil of gaultheria, given in 118 cases of acute articular rheumatism. It can be administered in capsules, alone or with salicylate of sodium, or in soda water, but the preferred method was in an emulsion in glycerin and water. From 10 to 20 minims were given every two hours during the day, and at intervals of three hours during the night. All forms of rheumatic pain seemed remarkably influenced, but its effect was most marked in acute inflammatory cases. The tendency to cardiac complications seemed not to be increased. The success was so gratifying that further trial of the remedy was strongly urged.—Amer. Jour. Pharm., April 1885, 163; from N. Y. Med. Jour., Nov. 8, 1884; Med. Times.

Oil of Cade—Source and Method of Production.—When, a few years ago, it was suggested that oil of cade (*oleum cadinum; oleum cadi; huile de cade*) should be introduced in the U. S. Pharmacopœia, objection was offered that it composition was of too indefinite a character to have a proper place among official or officinal drugs; it was therefore not introduced into the sixth decennial revision. The chairman of the committee of revision, Dr. Charles Rice, of New York, has, however, taken a lively interest in endeavoring to discover the origin and mode of preparation of this drug, which has, within the last fifteen years, been so extensively employed by a certain class of medical practitioners.

While in Europe last winter, Dr. Robert Amory received a request from Dr. Rice that he should personally examine the manufacture of the so-called oil of cade, with the view of clearing up doubtful points which might be of use to the committee on revision of the U. S. Pharm.; he now reports the result as follows:

"Having obtained from Dr. Rice's notes sufficient information to direct my inquiry to definite persons and localities, I visited, during my sojourn at Nîmes, some of the large manufacturing druggists, among them Mr. Sagnier, who gave me in detail all one would care to know of the methods of manufacture. With this information he also furnished me with a specimen twig brought at his request by a peasant from Var, who sold him the cade oil. This twig was taken from the tree or shrub which yields the commercial oil of cade, and was accompanied by a specimen of the oil. The process by which this is obtained is as follows:

The dry, not sappy, portions of the wood of *Juniperus Oxycedrus*, L., as well as the roots, leaves and twigs, are gathered at all seasons of the year by the peasants in the department of the Var, in the south of France, and chiefly among the hills and in the wild country. These are all cut up into small pieces, and carefully laid one upon another so as to facilitate free combustion ; a fire is kindled ; the whole is then covered up with earth so as to hermetically seal it from the air, and the products of the dry distillation *per descensum* rudely conveyed into wooden buckets or barrels. This product resembles thin tar, and is carried by the peasants on their own or their donkeys' backs down to the settlements, and generally into Nîmes or Toulon. The drug-merchants sell this tar, without purification, just as they receive it from the peasants. I could not personally visit the hill country, where this rude form of distillation is practiced, because it was several days' journey on foot or on donkey's back ; hence I am forced to give the information on hearsay. However, I saw the peasants who conducted the distillation, and talked with them. Mr. Sagnier, Jr., informed me that during his boyhood, about thirty-five years ago, the peasants in the vicinity of Nîmes used to carry on this work, but latterly were obliged to leave it to others living more remote, because they had destroyed so many of the trees that it took too much time to collect the wood necessary for any large amount of distillation. Mr. Sagnier, the father, had seen many of these distilleries, and he described the process as being very simple and rude. Toulon is so much nearer to the place where these trees are now mostly found that the peasants trade most generally with that city at the present time. I brought with me to this country a small branch of the tree from which this distillation is conducted, and am informed by Dr. Rice that it is from *Juniperus Oxycedrus*, L., but the specimen is now so dry that it would hardly bear transportation. There is reason to believe, however, that other allied species of *Juniperus* are sometimes utilized by the peasants, either by accident or design, for the same purpose ; that the common savin (*Juniperus Sabina*, L.) is, or at least has been, among these, may be inferred from some specimens of the *cadrier* in the possession of Dr. Rice. The difference in shape and construction of leaves, etc., between the savin on the one hand, and the common juniper, or the *Juniperus Oxycedrus*, on the other, makes it highly improbable that the substitution is due to accident. Whether other species are also used, such as have been reported by various writers, viz : *Juniperus phœnicea*, L., *J. thurifera*, L., etc. (the latter is said to be rare in southern France, but more common in Spain and Portugal), could only be ascertained by a prolonged personal inquiry over the whole district where the product is made, and this does not appear to be of so great value as to justify the expenditure of so much time and money specially for this purpose.

There has been an apparent mystery regarding oil of cade, because it could only be directly purchased through Paris, Nîmes, Toulon, or Marseilles; its centre of commercial distribution being at Nîmes. Hebra's reintroduction of its use as a remedy in cutaneous diseases naturally led to its more general introduction into commerce all over the civilized world, and hence it can be found in the shops of most of the druggists in large cities. Yet there is no certainty as to its being a definite pharmaceutical article, the purity of which can be tested by physical or chemical means. Physicians, therefore, are apt to rely upon their individual experience as to the source from which they desire their patients to obtain their supply. The mystery, if any exists, in regard to the distribution of oil of cade from Nîmes as a central depôt, is simply due to its historical relations. It was first used as a parasiticide in that city and its environs, in a wash for sheep who had the itch (*la gale*). It was found useful in the destruction of the sheep-tick and other parasites, and did not injure the sheep or their wool. Its empirical use in diseases of the human skin sprang from its success with sheep-skin diseases. Its medicinal use is not modern, since it is very clearly described as early as the first century, by Dioscorides (see Kühn's edition, I., 105). And it has frequently been employed or recommended before Hebra's time, in the treatment of skin diseases, as, for instance, by Larsen (*Hosp. Meddelelser* III., No. 3), Giber (*Gaz. d. Hôp.*, 1857, 93.) *Bull. de Thér.*, 1858, Aug.), H. van Holsbeck (*Presse Méd.*, 1857, 28), and others.

It is evidently a mixed tarry product, and is received in this country probably exactly of the same character as that which is distilled by the French peasants who call it *huile de cade*, from their common name of the small tree from which it is derived, viz., the *Cedrier*, or *Cadrier* in their dialect. I saw the trees growing near the Pont du Gard, which is about half way between Avignon and Nîmes; the red berries had fallen from the tree to the ground, and looked about the size of small cranberries, but of a lighter shade of red; they had thin skins, and were soft and pulpy. The peasants who live near Pont du Gard described the process of distillation as being the same which was communicated to me by Mr. Sagnier, of Nîmes.

The amount of oil of cade sold at Nîmes does not represent that which is manufactured, since there is a large amount locally used in the department of the Var for sheep-washing. The medicinal virtue of cade oil or tar may be different from that of other tars, but probably this matter is better known to dermatologists than to the general practitioner.

The price of this tar is very low, so that, as Mr. Sagnier said, there is probably no profit in making an unadulterated substitute. It costs at Nîmes from 1 to 2 francs the kilogramme, that is, about 10 to 20 cents a pound, which is but little encouragement towards making any tarry substitute for the crude nasty stuff originally sold by the Nîmes merchants for the purpose of destroying sheep vermin and skin diseases consequent to these or to some other parasitic origin.—Amer. Drug., Dec. 1884, 223–224.

Oleum Rusci—Examination of Commercial Samples.—P. Macewan has examined three commercial samples of this tar, the odor of betulin being present in each, but harsher in the German and Dutch oils than in the Russian, which is pleasant. The saponifiable substances were ascertained by shaking the ether solution with excess of potash solution, acidifying the alkaline liquid, and treating with ether.

	Russian.	German.	Dutch.
Physical properties. . .	Thick brown-black, sp gr. .955.	Limpid, brown, sp. gr. .967.	Limpid, translucent, red-brown, sp. gr. 941.
Cold water filtrate. . . .	Colorless, fragrant.	Yellowish brown, empyreumatic.	Yellow, empyreumatic.
Blue litmus	Faintly acid.	Distinctly acid.	Faintly acid.
Fe_2Cl_6 (solution)	Green brown.	Greenish brown.	Pale brown.
Fe_2Cl_6 on dilution . . .	Muddy.	Loses transparency.	Clear.
KCy (solution).	Pink, intensified by AmHO.	No change.	No change.
Non-saponifiable bodies.	64.47; red-brown, oily odor unaltered.	16.12; similar to Russian.	36.54: pale-brown, limpid, odor terebinthinate.
Saponifiable bodies . . .	16.57; black, consistence of lard, slightly empyreumatic.	19.84; black, sticky, resinous, strongly empyreumatic.	10.62; brown, semi-fluid, resinous, intensely empyreumatic.
Insoluble and vaporized below 100° C.	18.96 per cent.	64.04 per cent.	52.84 per cent.

—Am. Jour. Phar., July 1885, 355; Phar. Jour. and Trans., March 21, 1885, p. 769.

ALCOHOLS.

Absolute Alcohol—Fallacy of Established Tests.—Dr. E. R. Squibb observes that the test of Cassoria—shaking absolute alcohol with white, dried or anhydrous sulphate of copper, when, if water is present, the sulphate will be hyd rated by it and turn blue—is fallacious, although given as being trustworthy by all the authorities examined excepting one. Absolute alcohol of a sp. gr. of .7936 at 15.6° C., compared with water at 15.6° C. as unity, when diluted with .5 per cent. water, stands this test. This same dilution also stands the test of forming a perfectly clear solution with all proportions of carbon disulphide and of oil of copaiba. Neither does alcoholic solution of caustic baryta give any reaction. In short, no test has been yet proposed that will detect the water present in alcohol which contains less than 1 per cent.—Ephemeris, July 1884, 586.

Absolute Ether—Preparation, Specific Gravity, etc.—Dr. E. R. Squibb very exhaustively reviews the authoritative quotation as to the specific gravity of absolute ether, and describes the apparatus employed at his establishment for the preparation of ether. He also gives an elaborate description of the method employed by him for obtaining absolute ether and determining its specific gravity, which he finds to be .71888 at 15.6°

C., as compared with water at the same temperature as unit. The paper concludes with a table showing the specific gravities of ether containing different proportion of alcohol of sp. gr. .82013 —Ephemeris, July 1884, 586–598, and Nov. 1884, 676–678.

Ether—Absorption of Ozone.—Buchner has observed that commercial "pure" ether, even after further purification, gave rise to some oxyiodide in contact with iodide of cadmium, iodine being liberated at the same time. At first he was disposed to attribute the reaction to some persistent impurity in the ether, but he has now come to the conclusion that it is due to dissolved ozone. Schönbein has already observed that ether, in contact with atmospheric air, is capable of giving rise to the formation of ozone, and the author has ascertained that this change takes place with extreme rapidity under the influence of diffused sunlight, but that freshly rectified ether will remain free from ozone for several weeks if kept in the dark. The practical lesson drawn is that in order to preserve ether in a proper condition, it should be protected from light.—Phar. Jour. and Trans., May 30, 1885, 987; Chem. Ztg., May 13, 1885, 691.

Ether—Impurity.—Mr. C. J. H. Warden, while in India, accidentally discovered that all the samples of ether in his laboratory, which ether had been supplied by a well-known English firm as pure, liberated iodine when agitated with an aqueous solution of iodide of potassium. The author has since obtained the reaction in England with a sample of ether from the same firm; and, although he has not determined the cause, attributes it to the presence of aldehyde. He suggests that the peculiar suffocating sensation often experienced during ether inhalation may be caused by the presence of this compound, and states that the test suggested by him may be applied in two ways: Two or three drachms of the ether are poured into a test tube. and about a drachm of a freshly-prepared solution of iodide of potassium in water added, the tube corked, and the contents well agitated. If the ether be pure, on looking down the tube, while standing on a white surface, no yellow coloration of the aqueous stratum will be apparent. The other plan of applying the test is to add a few drops of starch mucilage to the ether and iodide of potassium solution and then to agitate; if iodine be liberated, it is recognized by the blueing of the starch.—Phar, Jour. and Trans., Jan. 3, 1885, p. 521; Amer. Jour. Phar., Mar. 1885, 148–149.

Ether.—Test for the presence of water by means of *Paraffine oil*, which see under "Hydrocarbons."

Ethereal Salts—Preparation by Double Decomposition.—Mr. G. Bertoni had previously found that when amyl nitrite is digested with ethyl or methyl alcohol double decomposition takes place with formation of ethyl or methyl nitrite, and regeneration of amyl alcohol. Messrs. G. Bertoni and F. Truffi now give the results obtained with propyl alcohol (b. p. 97°) and isobutyl oil (b. p. 107°). The amyl nitrite was prepared from fermentation amyl alcohol (b. p. 128°–132°).

Propylic Nitrite.—Amyl nitrite and propyl alcohol in molecular proportions were placed in a flask furnished with a four-bulb fractioning tube and gradually heated, collecting the portion which came over below 64°; this, after being dried with fused nitrate of calcium, and submitted to fractional distillation, gave pure propyl nitrite (b. p. 57°) which was subsequently completely reconverted into propyl alcohol by digestion with methyl alcohol It was found that 51.6 per cent. of the propyl alcohol was converted into nitrite.

Isobutyl Nitrite.—On heating, a mixture of amyl nitrite and isobutyl alcohol in the manner described above, isobutyl nitrite was obtained, boiling at 66°–70°, the proportion of alcohol converted, however, being only 37.8 per cent. From their experiments the authors deduce the following limit of the formation of nitrites by double decomposition: Methyl alcohol = 100 per cent., ethyl alcohol = 85 per cent.; propyl alchol = 52 per cent.; isobutyl alcohol = 37 per cent. The limit of etherification decreases with the molecular weight, and this decrease is regular, amounting to about 15 per cent. between each alcohol.—Phar. Jour. and Trans., Nov. 8, 1884, 366; Jour. Chem. Soc., Nov. 1884; Gazz. Chim. Ital. xiv., 23–29.

Ethyl and Methyl Iodide.—Preparation by the aid of *Paraffine Oil*, which see under "Hydrocarbons."

Ethyl Nitrite—Simple Method of Estimation in Spirit of Nitrous Ether.—Mr. Alfred H. Allen, after revising the different methods for estimating the strength of spirits of nitrous ether, and particularly that of Prof. J. E. Eykman (see Proceedings 1882, 108), which he holds to be the most reliable hitherto recommended, proposes the following as being not alone more readily executed but more accurate than that of Prof. Eykman. It is the outcome of a large number of experiments made to test the constancy of the results under different conditions of operating. A nitrometer should be filled with strong brine and 5 cc. of the sample to be tested should be placed in the cup of the nitrometer, and allowed to enter through the tap, taking care that no air gets in at the same time. Five cc. of a strong solution of potassium iodide is next allowed to enter, and this is followed by about 5 cc. of dilute sulphuric acid. Effervescence immediately ensues, and if the tube be vigorously agitated at intervals, the reaction is complete in five minutes, when the level of the liquid in the two limbs of the nitrometer is adjusted, and the volume of nitric oxide gas read off. If the volume of gas evolved be small, another 5 cc. of the sample should be let into the nitrometer, and the agitation repeated. The calculation is the same as in Eykman's process, the reaction being:

$$(C_2H_5)NO_2+KI+H_2SO_4=(C_2H_5)OH+KHSO_4+I+NO.$$

When strictly accurate results are not required, the volume of gas need not be corrected for variations of pressure, temperature, and tension of aqueous vapor, and if these considerations be omitted the calculation is much simplified. Thus, if 0.030 gram of nitric oxide (representing 0.075 gram of $C_2H_5NO_2$) under the *ordinary* conditions of pressure and temperature be taken to measure 23.55 cc., then

$$\frac{\text{volume of gas in cc.}\times 0.3185}{\text{measure of sample in cc.}\times\text{density of sample}}=\text{percentage by weight of } C_2H_5NO_2.$$

If the density of the sample be omitted from the equation, the result will be the number of grams of ethyl nitrite per 100 cc. of the sample.

The nitrometer method has been proved to give very good results with pure sodium nitrite (prepared from silver nitrite) employed in known amount. The results with spirit of nitrous ether are somewhat higher than those given by Eykman's method, the difference being least when sodium chloride is employed in the latter process, and time given for the ferrous solution to react thoroughly on the solution of ethyl nitrite. The results by the iodide method are almost certainly more accurate than those by Eykman's process. With most specimens of sweet spirit of nitre, a considerable amount of nitric oxide is produced (and iodine liberated) before adding the acid, the reaction probably depending on the presence of free acid in the sample. The results obtained in the nitrometer are remarkably constant, and the method furnishes a very easy means of assaying sweet spirit of nitre with considerable accuracy, which is further increased if a correction of 1.5 cc. (=0.0048 gram of $C_2H_5NO_2$) be made for solubility of the gas. The process has the advantage of great ease and rapidity, and actually measures the nitrous compounds present in the sample, instead of leaving their proportions to be inferred from a more or less complex reaction, such as the reduction of permanganate, etc. In the following results no correction was made for pressure or solubility, the figures representing the actual volumes of gas measured at about 15° C.

	Volume of NO from 5 cc.	Weight of NO from 5 cc.	$C_2H_5NO_2$ per cent.
	cc.	Milligrams.	
1. 25 per cent. sol. in absolute alcohol (two months old)	(290.0 from 0.5 cc.)	923.6	22.02
2. Spt. Nitrous Ether B. P. (two months old)	39.4	50.4	2.98
3. Spt. Nitrous Ether B. P. (age unknown)	27.0	34.6	2.63
4. Spt. Nitrous Ether B. P. (age unknown)	34.8	44.3	2.62
5. "Spt. Æther. Nit. .850" (new)	14.7	18.8	1.10
6. "Sp. Æther. Nit. Dulc. .900" (new)	22.0	28.2	1.56

—Am. Jour. Phar., April 1885, 183–189; from Phar. Jour. and Trans.

Chloroform—Formation of a Hydrate.—Messrs. Chancel and Parmentier state that in keeping a mixture of chloroform and water in melting ice for some time, they have observed a formation at the line of separation between the two liquids of crystals, which proved to consist of a perfectly definite hydrate of chloroform, represented by the formula $CHCl_3$, 18 H_2O. The crystals were colorless plates, somewhat resembling that of chlorate of potassium, sometimes of considerable diameter. They melted at 1.6° C., yielding a milky liquid, which quickly cleared, separating into layers of chloroform and water. Their formation is favored by agitation of the mixture, though not always certain, whilst if the temperature falls below 0°, there is instead a formation of ice containing small quantities of chloroform.—Compt. Rend. c., 27; Phar. Jour. and Trans., Jan. 31, 1885, 615.

Iodoform, Bromoform, and Chloroform—Preparation by Electrolysis.—The Chemische Fabrick auf Actien in Berlin recommends that iodoform, bromoform, and chloroform, should be obtained by electrolytic means from the corresponding halogen derivatives of the alkalies and alkaline earths, in the presence of alcohol, aldehyde or acetone. For instance, 50 kilos. of iodide of potassium are dissolved in 300 kilos. of water, and the solution is mixed with 30 kilos. of 96 per cent. alcohol. The mixture is subjected whilst hot to electrolytic action, a continuous stream of carbonic acid being passed into the solution. The iodoform thus obtained is deposited in the form of a crystalline powder.—Phar. Jour. and Trans., June 6, 1885, 1012; Jour. Chem. Soc., April 1885; Dingl. Polyt. Jour., cclv., 88.

Iodoform—Test of Purity.—Dr. Brouma was led to believe that the discordant results obtained by various experimenters with iodoform were, at least partly, due to the presence of certain impurities, and after having made a large number of experiments with *pure* iodoform, which had been found to stand the (additional) test given below, he found that it did not produce the toxic symptoms reported by others, or at least but rarely. The test is the following: A certain quantity of iodoform is shaken for some time briskly with distilled water, and the mixture then filtered. The filtrate is mixed with a little alcoholic solution of silver nitrate, and the mixture set aside for twenty-four hours. If the iodoform was impure, a black precipitate, consisting of reduced silver, will be formed, while, if the preparation was pure, there will only be a faint whitish-gray turbidity. All samples of iodoform which produced toxic symptoms, when tested in the above manner, reduced the silver solution.—Amer. Drug., Dec. 1884, 232; from Journ. de Pharm. d' Als.-Lorr.

Iodoform—Uses.—Unna recommends iodoform for the healing of soft chancres, and for obviating the occurrence of suppurating buboes. The sore is first dried with absorbent cotton, then a drop of solution of iodoform in ether is spread upon the sore, and when it has become dry, it is covered with a piece of iodoform plaster or muslin. To conceal the smell the whole is covered with cotton, perfumed with an alcoholic solution of coumarin or other aromatic spirit. For the preparation of *Pencils of Iodoform*, Unna recommends iodoform 10 gm., acacia 3 gm., tragacanth and glycerin, each 1 gm.; sufficient water being used to form a mass, which is made into 5 pencils.—Amer. Jour. Phar. Jan. 1885, 30; from Monatschr, f. Dermatol. Aug. 1884.

Iodoform—Presence of Iodine in Urine after its Application.—Mr. J. Gruendler observes that in a few cases of the application of iodoform, no iodine was found in the urine, but in all other cases in which poisoning did not occur, the iodine is present in the urine chiefly as potassium iodide, but to some extent also as iodate. In cases of poisoning by iodoform, the iodine is discharged not so much in the form of potassium iodide as in combination with organic compounds. From this it is concluded that if a means were discovered by which the iodine could be converted, before its absorption, into potassium iodide, a protection against poisoning might be secured.—Amer. Drug., June 1885, from Chem. Centralbl.

Iodoform.—Detection of *Picric Acid* in admixture, see under "Organic Acids."

Iodoform—Cleaning Mortars—Mr. Slodki recommends the following method for cleaning mortars which have been used in making preparations of iodoform. After having washed the mortar, or if greasy, having cleaned it with saw-dust, a little alcohol is poured in, ignited, and stirred about with the pestle. When all the alcohol is consumed, the mortar and pestle are washed with water, and all traces of iodoform will then have disappeared.—Amer. Drug. Jour., 1885, 113; from L'Union Phar.

Paraldehyde—Use for the detection of *caramel*, which see under "Carbo-hydrates."

Chloral—Improvement in the Process of Preparation.—According to Page, a larger yield is obtained when the alcohol used for the preparation of chloral is treated with 5 per cent. ferric chloride or thallium chloride previous to the introduction of chlorine. The resulting liquid, consisting of a mixture of chloral, hydrate of chloral, and chlorinated ethanes, which can be separated by fractional distillation, is subjected to distillation, ferric chloride or thallium chloride remaining in the residue. The chlorinated ethanes, which come over at a temperature above 100°, are purified by fractional distillation, the mixture of chloral and hydrate of chloral is distilled over calcium carbonate, treated with the requisite quantity of water, and the resulting hydrate of chloral re-crystallized from the chlorinated ethanes previously obtained.—Amer. Drug., March 1885, 44; from Dingl. Polyt. J. and J. Chem. Soc.

Chloral Hydrate—Action of Metals.—Mr. M. S. Cotton states that zinc foil scarcely attacks an aqueous solution of chloral hydrate at the ordinary temperature, but at 80° or 100° a rapid action sets in, with formation of hydrogen, methane and oxychloride of zinc. Zinc dust acts more energetically, and at the ordinary temperature, the same products being formed together with chlorinated methanes, and the reaction proceeding almost on the same line as the reduction of chloroform by zinc. The action of iron on chloral hydrate depends on the temperature and state of division of the metal; besides methane and chloro-methanes, other products are formed, the nature of which is still under investigation.—Phar. Jour. and Trans., April 18, 1885, 853; Bull. Soc. Chim., xiii., 622–635; Jour. Chem. Soc., April 1885.

Chloral Hydrate—Use as a Vesicant.—Dr. A. M. Fauntleroy recommends powdered chloral sprinkled on adhesive plaster and melted by a gentle heat (not more than enough to cause the plaster to adhere to the skin), it is applied while warm to the part where the blister is wanted; within a few minutes a gentle heat is felt, increasing in intensity for a short time, then gradually easing off, and at the end of about ten minutes the part is free from pain, and effectually blistered. Thus, within about ten minutes the work of an old-fashioned blister is accomplished, with many advantages over the latter: (1) rapidity of action, (2) the ease of application, (3) the non-occurrence of strangury, and (4) farther, it may never be taken off to have the blister dressed, but may be allowed to remain until the plaster loosens and comes off itself, the blistered surface in the meanwhile healing kindly.—Amer. Jour. Phar., Dec. 1884, 644, from Southern Clinic.

Amyl Nitrite—Value as an Antidote to Strychnine.—Dr. H. O. Hare recommends amyl nitrite as an antidote to strychnine. It cannot be used by inhalation, but must be given in such quantities and at such times that its full physiological action be present constantly; it is useful only for tiding over the patient until more persistent antidotes can be administered.—Amer. Jour. Phar., April 1885, 206, from Bost. Med. and Surg. Jour., Nov. 20, 1884.

Amyl Nitrite—Administration by the Mouth.—Dr. Richardson gives the following formula for the administration of amyl nitrite by the mouth: Amyl nitrite, pure, minims xxxvi; ethylic alcohol (sp. gr. 830), drachms vi; glycerin to one and a half ounces. One fluidrachm to be taken in a wineglassful of warm water. In asthma this method is specially recommended.—Amer. Jour. Phar., Dec. 1884, 644, from Weekly Medical Review.

Methylic Alcohol—Removal of Acetone.—It is pretty well understood that all commercial specimens of methylic alcohol contain more or less acetone, which, upon the addition of iodine, gives rise to the formation of iodoform. In order to get rid of this impurity, it has been proposed to treat the crude spirit so as to convert the methyl alcohol into oxalate of methyl, and then regenerate the alcohol by treatment with a base. But even after this operation there still remains some impurity capable of converting iodine into iodoform. In order to remove these last traces, Messrs. Regnauld and Villejean advise the conversion of the foreign compound into iodoform, and the decomposition of this into alkaline iodide and formate. To effect this, about one-tenth of its weight of iodine is added to the regenerated alcohol; solution of soda is then added gradually to complete decolorization and slight alkalinity, and the whole is then carefully distilled. After rectification over quicklime, the methylic alcohol so obtained has a density of 0.810 at 15° C.—Répert. de. Pharm., Sept. 1884, 413; Phar. Jour. and Trans., Sept. 27, 1884, 243.

Chloride of Methyl—Use in the Treatment of Neuralgia, etc.—Dr. Tenneson recommends chloride of methyl, used in the form of spray, in the treatment of neuralgia, articular and muscular rheumatism, pleurisy, acute pneumonia, and tuberculous joint diseases, in all of which pain is at once relieved by the local use of the spray. A prolonged erythema, more or less cutaneous hyperæsthesia, and blistering are some of the minor accidents that may occur, and which are avoidable by not directing the spray upon a single spot for more than five or six seconds at a time.—Amer. Drug., May 1885, 97; from Rev. de Méd. and N. Y. Med. Jour.

Chloride of Methylene—Unsatisfactory Character of the Commercial Article.—In a memoir published a few months since, Messrs. Regnauld and Villejean gave their reasons, based upon chemical analysis, for believing that the product at that time supplied to surgeons under the name of chloride of methylene was often, if not always, a simple mixture of chloroform and methylic alcohol. Subsequently, with a view of studying the subject physiologically, they prepared what they claimed to be pure chloride of methylene, the action of which was tested on dogs and other animals, comparative experiments being also carried out with chloroform. They report in the "Pharmaceutical Journal" that the results strengthened their previous belief, and that the misnamed mixtures owe their properties to chloroform only. The physiological action of chloride of methylene was found to differ entirely from that of chloroform, with the exception that both compounds produced unconsciousness. The symptoms resulting from the inhalation of chloride of methylene were so constant, and of such an alarming character, that the authors think its employment as an anæsthetic agent during surgical operations is out of the question, and they doubt whether it has ever been so employed. Clonic contractions of muscles, of epileptiform and choreiform kind, were the alarming symptoms observed, but such movements are by no means confined to one member of the chlorine series of anæsthetics.—Amer. Jour. Phar., Dec. 1884, 645; from Therapeutic Gazette.

Bichloride of Methylene—Anæsthetic Value.—Dr. B. W. Richardson, referring to certain statements describing bichloride of methylene as a mixture, maintains that as introduced by him it is a substance sufficiently definite, having a composition CH_2Cl_2, a vapor density of 42, and a boiling point of 106° F. He describes it as narcotizing with the greatest steadiness, but more readily than chloroform, than which he believes it also safer, though probably less safe than ether. Several instances of unfavorable results are mentioned with what was purported to be this substance. In one instance it was chloroform, in the second case methylene mixed with some form of ether, and in the third case some compound containing free chlorine.—Pharm. Jour. and Trans., Aug. 2, 1885, 81; from "Asclepiad," 282.

Phenol.—Occurrence in the different parts of *Pinus sylvestris*, which see under "Materia Medica."

Phenol—Estimation in Commercial Carbolic Acid.—Mr. Kleinert has compared the results of estimating phenol by Koppeschaar's method (titration by means of standard bromine solution) and by fractional distillation. He finds that they in nowise agree, the bromine titration yielding figures which are far higher than the quantity of phenol which can be present. All samples which he examined yielded but a very small proportion of products volatile between 150° and 200°, phenol distilling between those temperatures. Between 200° and 250°, the largest fractions are obtained, practically devoid of phenol, and yet giving copious bromine precipitates. Even at temperatures higher than 250° distillates are obtained, which give the bromine reaction, but do not show the well-known phenol indications with ferric chloride, hypochlorite, or fir-wood and hydrochloric acid. Kleinert, therefore, concludes that Koppeschaar's method is not applicable for the valuation of commercial carbolic acid.—Amer. Jour. Phar., Sept. 1884, 482–483; Zeitschr. Analyt. Chem. [23], 1 to 13.

Carbolic Acid—Liquefaction.—Dr. Vulpius, in view of the conflicting statements of different authorities (mainly arising from the fact that each author used an acid of different melting point), has investigated the conditions under which crystallized carbolic acid may be rendered permanently liquid. He used for his experiments the so-called absolute phenol (in loose crystals), melting over 40° C. He tried various proportions of water, alcohol, and glycerin, which were mixed with the gently melted acid, and obtained the following results:

Carbolic Acid.	MIXED WITH			Congeals at	
	Water.	Alcohol.	Glycerin.	F°.	C°.
parts.	parts.	parts.	parts.		
100	5	—	—	21	70
100	7	—	—	17.5	63.5
100	8	—	—	15	59
100	9	—	—	13.5	56.5
100	10	—	—	11.6	53
100	11	—	—	10.2	50.5
100	12	—	—	9	48.2
100	13	—	—	7.5	45.5
100	14	—	—	6	42.8
100	15	—	—	4.5	40
100	20	—	—	2.2	36
100	5	—	5	18.5	65.5
100	5	—	10	15.5	60
100	—	—	10	27	80.6
100	—	5	—	29	84.2
100	—	10	—	19	66.2
100	5	5	—	14	57.2

These figures show the remarkable fact that the melting point of phenol is much less depressed by alcohol than by an equal quantity of water; and the latter is even superior to glycerin in liquefying power. It will also be seen that an addition of 10 per cent. of water (to absolute phenol) is insufficient to keep the mixture liquid at moderately low temperatures. It will be necessary to increase the water to 15 per cent., but it is still better to use 20 per cent., since this facilitates calculation. It need not be feared that this proportion would come too close to the extreme limit of water which carbolic acid is capable of taking up. The above experiments show, contrary to all authorities, that 100 parts of (absolute) phenol can take up a little over 36 parts of water, at 15° C. (59° F.) without becoming turbid.—Amer. Drug., July 1884, 127; from Pharm. Zeitg.

Carbolic Acid—Solubility in Liquid Paraffin (Pharm. Germ.) and in Benzin.—Dr. Schweissinger has examined the solubility of *absolute* carbolic acid in paraffin (Germ. Pharm.) and in petroleum benzin of sp. gr. 0.059, with the following results:

1 part of carbolic acid is soluble in

20 p. of liquid paraffin at 44° C.
30 " " " 32° C.
40 " " " 24° C.
40 " " " 20° C.
60 " " " 17° C.

1 part of carbolic acid is soluble in

1 p.	benzin at	43° C.	8 p.	benzin at	20° C.
2 p.	"	42° C.	9 p.	"	27° C.
3 p.	"	41° C.	10 p.	"	25° C.
4 p.	"	39° C.	15 p.	"	23° C.
5 p.	"	37° C.	20 p.	"	21° C.
6 p.	"	35° C.	30 p.	"	19° C.
7 p.	"	32° C.	40 p.	"	16° C.

—Amer. Drug., June 1885, 113; from Pharm. Zeit.

Carbolic Acid—Detection in Creasote.—Eykman has observed that when a few drops of sweet spirit of nitre are mixed with a dilute solution of carbolic acid and an equal volume of strong sulphuric acid added, a pink colored ring is formed, and on mixing, a red colored solution is obtained. In a paper communicated to the Edinburgh Chemists' Assistants' Association, Mr. P. Macewan proposes to take advantage of this reaction for the detection of phenol in creasote. Creasote gives a brown ring and brown solution, but if it contain phenol the sulphuric acid acquires a pink tint (transient, if a small percentage only is present), and when the layers are mixed a reddish-brown froth is produced. If the mixed solution from pure creasote be allowed to stand until the flocculence rises to the surface, the clear solution is found to be of a pale-brown color; but if the creasote contain phenol the solution is dark red or reddish-brown.—Amer. Drug., April 1885, 75; from Chem. and Drug.

Carbolic Acid—Value in the Treatment of Intermittent Fever.—Dr. Dieulafoy has used carbolic acid hypodermically with success in the treatment of intermittent fever. A 1 per cent. solution was injected, commencing with 1 cc. and increasing to 5 cc., varying the quantity according to the symptom, the treatment requiring a fortnight. Neither general nor local disturbances were observed, and the patient, who had had three previous attacks, all cured by sulphate of quinine, was seen in perfect health three months after leaving the hospital.—Brit. Med. Jour., Jan. 24, 1885, 199; Pharm. Jour. and Trans., Jan. 31, 1885, 613.

Carbolic Acid—Value in Indigestion.—Dr. J. T. Dixon recommends the use of carbolic acid as an internal remedy for indigestion attended with flatulence and tenderness of the stomach and acidity. He uses it in the form of solution, 2 minims to the ounce of water, with the addition of 5 grains of carbonate of sodium and 25 minims of aromatic spirit of ammonia.—Phar. Jour. and Trans., March 28, 1885, 791; Brit. Med. Jour., March 7, 1885, 483.

Phenol Camphor—Remedial Value, etc.—Dr. Theodore Schaefer states that he noticed, several years ago, the fact that, when crystallized carbolic acid is liquefied by means of heat, and camphor is gradually added, a permanent liquid is obtained which is colorless, refractive, possesses the odor of camphor without a trace of that characteristic of carbolic acid, and has a sweetish, camphoraceous, but biting taste, not so caustic as that of carbolic acid, but somewhat benumbing to the tongue. It is soluble in alcohol, ether, chloroform, and ethereal oils, but is insoluble in water, and is heavier than the latter. It burns with a smoky flame, and possesses the advantage over carbolic acid of being less irritating and caustic, and of having a pleasant odor. Dr. Schaefer has used it successfully for lessening the pain of toothache and ingrowing toe-nails, and as a local application in certain parasitic skin affections.—Amer. Drug., April 1885, 69; from Boston Med. and Surg. Jour.

Resorcin—Importance of Purity for Medicinal Use.—Recent investigations have demonstrated that the disagreeable side-affects of resorcin, the nausea and vomiting, are by no means due to the remedy itself, but to the impurities accompanying it. Since the *resorcinum purissimum vel resublimatum* has been in the German market the reports of reliable authors have accumulated, which prove that resorcin, if pure, is the most reliable remedy for vomiting we probably possess, and not only in adults but also in children. Besides its prompt effect in this regard, it is said also to stimulate and to strengthen to an extraordinary degree the digestive functions of the stomach and of the upper part of the small intestines.

Dr. Justus Andeer, in Munchen (Allg. Med. Centr. Zeit., July 5, 1884), recommends resorcin in these cases, in doses varying from sixteen to forty-eight grains, and draws the attention of the profession to the effect which the remedy exerts in very large doses, such as are employed in anæmia and chlorosis. Symptoms of intoxication set in, and the individual under its influence acts like a drunken person. A good *old* red wine (Bordeaux, Macon, etc.) acts like a specific, a few glasses of it putting at once an end to the symptoms mentioned. This action of the red wine is probably due to its containing iron in considerable quantities.—Amer. Jour. Phar., Dec. 1884, 640, from Med. and Surg. Reporter, September 13.

Resorcin—Antidote.—According to Dr. Justus Andeer, the best antidote to poisoning by resorcin is good red wine, either Bordeaux or Burgundy. The author considers the practice of giving an emetic useless, since the poison will have become absorbed by the stomach before dangerous symptoms are manifested. Hot baths, which have been suggested as a means of depleting the venous system, are found rather to increase the severity of the symptoms.—Phar. Jour. and Trans., June 27, 1885, 1067; Glas. Med. Jour., June 1885, 470.

Frozen Glycerin—Characters, etc.—Mr. Wallace Procter had opportunity to examine a quantity of frozen glycerin. About half the contents of a 50 lb. can was found to be completely solidified, this portion having a crystalline structure of great toughness and solidity. This portion could be partially melted, and, on again exposing it to refrigeration, the whole again became solid. When completely melted solidification did not again occur, at least not by ordinary refrigeration. The melting point of the crystals, roughly estimated, was between 21° C. and 28° C. The specific gravity, as ascertained by Prof. Trimble, was 1.2618, showing the crystals to be nearly absolute glycerin. The portion of glycerin which had not frozen or solidified had a sp. gr. of 1.235 to 1.237.—Amer. Jour. Pharm., June 1885, 273, 274.

Glycerin—Reaction with Arsenious Acid, which see under "Inorganic Chemistry."

Glycerin—Utility of Vapor for Cough.—Mr. Trastour has employed, wtth great advantage, the vapor of glycerin for alleviating distressing or frequent cough, irritation of the throat, etc. About 50 or 60 gm. of glycerin are heated in a porcelain capsule, and the vapor, which is copiously disengaged, is breathed by the sufferer. Carbolic acid dissolved in glycerin may also be employed.—Amer. Jour. Phar., April 1885, 173; Gaz. Méd. de Nantes.

Referring to the above, Prof. Henry Trimble observes that the question having arisen whether or not the vapor of glycerin would be given off when used as recommended, or whether irritating products of decomposition would be evolved, he undertook to make some experiments to settle the question. He found that when glycerin is treated as recommended at 92° C., vapor would, with some difficulty, be seen rising; at 100° C. it was very perceptible; at 130° C. it was abundantly given off, rising as a dense white smoke. This vapor was almost odorless, without the slightest irritation, and tasted sweet when drawn into the mouth. This evolution of vapor continued without the liquid in the capsule becoming dark until a temperature of 234° C. was reached. At 264° there was a slight boiling, but the glycerin had so nearly all vaporized that the experiment was discontinued. The room was so filled with vapor that one could not distinguish objects clearly at 10 feet away, yet none of those working there experienced any irritation or other difference, except the sweetish taste on drawing air through the mouth. This experiment was repeated with the same result, and shows that when exposed to the air with a gradual application of heat, glycerin will entirely vaporize with little or no decomposition. From this and other experiments made by the author, he concludes that the boiling point 290° C. of officinal glycerin is given too high in the Pharmacopœia, being that of absolute glycerin (sp. gr. 1.2653), and that it should be stated to boil not below 164° C., that being the boiling point of glycerin containing 95% absolute glycerin, and having a sp. gr. of 1.2526.—Amer. Jour. Phar., June 1885, 275–276.

Dynamite—Treatment for Headache Resulting from its Handling.—Mr. Wickham, surgeon of Nobel's Explosive Company, states, in reply to inquiries on the subject that, so far as he knows, the headache which follows the handling of dynamit, and which is due to the nitro-glycerin, is inseparable from the use of the explosive until immunity is produced either through prolonged exposure or idiosyncracy. Brandy and water, he says, will mitigate the pain, and sleep will generally remove it, but until tolerance is established there is no cure except cessation from working with the compound. No permanent injury, however, is known to result.—Phar. Jour. and Trans., May 2, 1885, 890; Lancet, April 11, 1885, 689.

FIXED OILS.

Fats—Examination.—Mr. E. Valenta has examined a series of fats by a method proposed by J. Köttstorfer, for the detection of foreign fats in butter. The fat to be examined, if necessary, is filtered whilst warm, and a weighed portion is saponified with standard alcoholic solution of potash. After warming on the water-bath about fifteen minutes, the excess of potash is titrated by half normal hydrochloric acid, using phenolphthaleïn as indicator. Pure butter fat requires per gram about 227 mgrms. of potassium hydroxide for saponification, whilst many fats used for adulteration, such as suet, lard, bacon fat, mutton fat, rape oil, olive oil, oleomargarin, poppy oil, and walrus oil, require about 197 or 198 mgrms. The author has examined both animal and vegetable fats. Some of the results obtained tend to throw doubt on the suitability of the method for butter testing, whilst in other cases the nature of single fats can be ascertained, and adulteration can be detected quantitatively, if somewhat considerable. The results obtained are given in tabular form. Palm-kernel oil with 247 mgrms., and cocoanut oil with 257 to 268 mgrms., are much higher than any others of the list, excepting cod liver oil with 213 mgrms. Cocoanut oil contains not inconsiderable quantities of lauric and myristic acids, also small quantities of caprylic acid, etc. These acids contain much less carbon in the molecule than do palmitic, stearic, and oleic acids, hence the high saponifying value of this fat. Apricot-kernel oil, oil of sweet almonds, oil of bitter almonds, arachis oil, cotton-seed oil, olive, sesame oil, average 193 mgrms. Pumpkin seed oil, oil-cake oil, rape oil (Hungarian product), average 188.1 mgrms. Rape oil, mustard-seed oil, and castor oil, average 177.1 mgrms. American bone fat, goose fat, pig fat, average 191 to 196.—Amer. Jour. Phar., Sept. 1884, 479; Dingl. Polyt. Jour. [249], 270–273.

Fats and Oils—Examination.—For the purposes of examination of fats, Hübl regards only those methods as useful which are based on quantitative determinations, whether of chemical or physical nature. Such methods, which the author calls "quantitative reactions," afford valuable indications of the purity of fats as they are connected with their chemical constitution; qualitative tests are of value in doubtful cases, and serve to control the conclusions drawn from the former. Of the three groups of acids present in fats, those belonging to the acetic acid series remain unaltered under ordinary conditions by haloids, while the acids of the oleic acid group take up two haloid atoms very readily, and those of the linoleic acid group four atoms. The author recommends for this purpose an alcoholic solution of iodine in the presence of mercuric chloride, which acts on the unsaturated fatty acids at the ordinary temperature, the excess of iodine used being estimated with a solution of sodium thiosulphate. The percentage of iodine taken up is called the "iodine number." The following table is given by the author:

Oils.	Iodine number.	Fatty acid		Saponification value.	Solution in equal parts glacial acetic acid is rendered turbid at
		Melts at	Solidifies at		
1. *Drying oils.*		Deg.	Deg.		Deg.
Linseed	158.0	17.0	13.3	194.3	
Hempseed	143.0	19.0	15.0	193.1	
Walnut	143.0	20.0	16.0	196.0	
Poppy seed	136.0	20.5	16.5	194.6	
Pumpkin seed	121.0	28.0	24.5	189.5	108
Sesame	106.0	26.0	22.3	190.0	107
Cotton seed	106.0	27.7	30.5	195.0	110
Arachis	103.0	27.7	23.8	191.3	112
Rape seed	100.0	20.1	12.2	177.0	Insoluble.
2. *Non drying oils.*					
Apricot kernel	100.0	4.5	0.0	192.9	114
Almond	98.4	14.0	5.0	195.4	110
Castor	84.4	13.0	3.0	181.0	Soluble in the cold.
Olive	82.8	26.0	21.2	191.7	85-111
Olive kernel	81.8	. .	. .	188.5	Soluble in the cold.
Bone oil	68.0	30.0	28.0		
Lard oil	59.0	. .	. .	195.9	
Butterin	53.3	42.0	39.8	.	
Palm oil	51.5	47.8	42.7	202.2	23.0
Laurel oil	49.0	27.0	22.0	. .	26.5
Tallow	40.0	45.0	43.0	196.5	95.0
Suet	36.0	41.8	40.0	170.0	
Cacao butter	34.0	52.0	51.0	. .	105.0
Nutmeg butter	31.0	42.5	40.0	. .	27.0
Butter fat	31.0	38.0	35.8	227.0	
Cocoanut oil	8.9	24.6	20.4	261.3	40.0
Japanese wax	4.2	. .	. .	222.0	

—Am. Jour. Phar., July 1885, 356; Dingl. Polyt. Jour. [253], 281–295; Jour. Chem. Soc., 1884, 1435.

Neutral Oleate of Mercury—Preparation.—Mr. Charles R. C. Tichborne observes that the formation of oleate of mercury by double decomposition is not attended with much success, and that it should be made by the direct union of mercuric oxide with a good commercial quality of oleic acid. The mercury should, furthermore, be in proportion to form a neutral oleate, and the combination must be effected in the cold, since it readily decomposes by heat. An excess of oleic acid, also, is detrimental to its keeping properties; hence the importance of preparing a neutral compound. Free oleic acid has a tendency to change to an irritating oxy-oleic acid, which it does at the expense of the mercuric oxide, as evidenced by the production of the metallic mercury. It may be made either from the red or yellow mercuric oxide; and, although the yellow is specified in the existing formula, finely levigated red oxide will be found preferable, using equal proportions, viz: 2½ parts of mercuric oxide for every 5 parts of the best commercial oleic acid. It does take a little trouble to form the mercuric oleate by the direct action of the oxide upon the acid, but if we possess machinery the process is rendered comparatively easy. It would be almost impossible to make this preparation were it not that mercuric oxide forms both basic and acid compounds. This fact shortens the process, which consists really, towards its conclusion, in getting a semi-solid substance (the acid oleate formed) to act chemically upon the remaining oxide.

The keeping and non-irritant properties of the resulting *neutral* oleate will repay the trouble spent in the manipulation.—Amer. Jour. Pharm., April 1885, 176–177, from Pharm. Jour. and Trans., January 17, 1885, p. 576.

Oleate of Cocaine—Remarks as to Strength and Preparation.—See *Cocaine*, under "Organic Chemistry."

Fat or Wax of Cinchona Barks—Determination of Characters.—The exact character of the body designated as "fat" or "wax," though the subject of numerous investigations, has hitherto not been satisfactorily determined. Dr. Hesse has undertaken the investigation, and has determined that cinchona barks contain, in varying quantities, three isomeric bodies of the formula $C_{24}H_{34}O$, one of which,

Cinchol, occurs only in true cinchona barks. Another,

Cupreol, is met with especially in cuprea bark; while the third,

Quebrachol, which appears to be identical with a body discovered by the author in quebracho bark, has been observed only in Ledger barks. All three bodies belong to the class of cholesterines to which also belongs the "phytosterin" prepared by the author from the calabar bean. They resemble one another very closely, but can be distinguished by their acetyl compounds. Dr. Hesse considers that the bodies described by Kerner and by Helms, consisted chiefly of cinchol.—Phar. Jour. and Trans., May 30, 1885, 986; Annal. d. Chem., ccxxviii., 296.

Ocotilla Wax—A New Vegetable Wax from Fouquieria Splendens, which see under "Materia Medica."

Lard—Preparation for Pharmaceutical Uses.—In a former paper (Phar. Jour. and Trans., Nov. 10, 1883, 365), Mr. W. Wilmott had stated as the result of certain experiments, that washing and straining, or washing and filtering, were without advantage in the preparation of lard for use as an unguent basis. Adverse comments having been made since then, the author has prepared lard by the different methods suggested, and now records experiments which tend to show that lard which is simply strained and not washed, is less liable to become rancid than that which has been filtered or washed, or washed and filtered. He recommends as the most desirable method for the preparation of lard for pharmaceutical use, one conforming to that suggested by Professor Redwood (see Proceedings 1884, 273); or one assimilating, with some slight modifications, to the process of the British Pharmacopœia of 1864. Both of these exclude washing and filtration.—Yearbook of Pharmacy, 1884, 505–509.

Olive Oil—Subacetate of Lead a Test.—In a former communication (see Proceedings 1883, 240), Mr. S. S. Bradford called attention to a peculiar red color produced by solutions of subacetate of lead upon cotton-seed oil, and recommended this reaction for its detection in admixture with other fluid oils, particularly olive oil. The author now finds that solution of subacetate of lead possesses the peculiar property of saponifying at once when shaken in the cold with pure olive oil. Now, if the sample tested contains any cotton seed or other oil, saponification will not take place, no matter how long it is allowed to stand, or how well it may be shaken; if there is any cotton seed oil in the sample, the red color will always be produced.

The want of a reliable test for olive oil has long been felt, and the author offers this one after a series of experiments with all the different oils, covering a period of over ten years, fully convinced that in this test we have one that can safely be relied on.—Amer. Jour. Phar., Sept. 1884, 470.

Chinese Cabbage Oil—Characters and Source.—This oil, obtained from the seeds of a species of Brassica, according to R. H. Davies, has at 60° F. the specific gravity .914; is of a deep brown color, somewhat thicker than olive oil; at 12° C. (10° F.) solidifies to a bright orange-yellow mass, and yields a rather dark colored elaidin. 100 grams of the oil required 0.125 gram caustic potash for neutralization, and 17.52 grams for complete saponification.

The mixture of fatty acids begins to soften at 17° C., melts completely at 22° C., has nearly the same saturating power as brassic acid, and contains oleic acid.—Phar. Jour. and Trans., Feb. 7, 1885, p. 635.

According to E. M. Holmes, this oil is probably obtained from the seeds of the "petsai," *Brassica sinensis*, which is largely cultivated in China. The oil is employed as a purgative, and externally for skin diseases; also, like a yellow colored brassica oil, which is probably obtained from *Br. campestris*, Lin., the *aburana* of the Japanese. This oil is used for culinary and lighting purposes, in tobacco manufacture to prevent the leaves falling to powder after rapid drying, and for the manufacture of lampblack for use in making Chinese ink. The residue, after the expression of the oil, is used for manuring plantations of tea and other plants.—Ibid., p. 636; Amer. Jour. Phar., June 1885, 306.

Tea Oil—Characters, etc.—This oil, obtained from *Camellia oleifera*, Abel, resembles olive oil in color, transparency and mobility, and has a characteristic odor and taste. Rob. H. Davies found it to have the spec. grav. .9175 at 60° F., and placed in a freezing mixture to deposit a solid fat, probably stearin. The oil, mixed with a drop of sulphuric acid, has a behavior similar to almond oil; nitrous acid solidifies it. It contains less free acid than olive oil. 1000 grams of tea oil require for complete saponification 195.5 grams of caustic potash; the oleic acid obtained amounted to 83.15 per cent., and about 10.8 per cent. was probably stearic or palmitic acid; an insignificant amount of fatty acid was soluble in water.—Phar. Jour. and Trans., Feb. 7, 1885, p. 634.

A specimen exhibited at the International Health Exhibition was labeled oil of *Camellia japonica*. It is used in Japan by watchmakers, and as a pomade, combined with Japanese wax and flavored with oil of cloves and other essential oils; it is non-drying, very fluid, free from unpleasant odor, and according to E. M. Holmes, could doubtless compete with almond oil and olive oil for many purposes.

In China the oil of C. oleifera is used for culinary purposes and as a hair oil, and is an important article of trade. The seeds of C. Thea were recently offered in London under the name of *tanne*, meaning seeds; they contain about 33 per cent. of oil, 13.8 per cent. of starch, and 1 per cent. of theine.—Ibid., p. 637; Amer. Jour. Pharm., June 1885, 306.

Oil of Elæococca Cordata (Wood Oil)—*Characters.*—This oil has a decided brown color, and a disagreeable odor, is rather more fluid than castor oil, and on exposure dries rapidly. According to R. H. Davies, its spec. grav. at 60° F. is .94015; it remains liquid at —13.3° C. (8° F.), becomes black with sulphuric acid, solidifies and becomes orange-yellow with nitric acid and yields with nitrous acid a dark semisolid mass. 100 grams of the oil require 0.39 gram caustic potash for neutralization, and 21.1 grams for complete saponification. The mixture of fatty acids weighs 94.1 per cent. of the oil, melts at 39° C., and its solution in alcohol readily yields crystals.—Phar. Jour. and Trans., Feb. 7, 1885, p. 636.

E. M. Holmes states that this dark-colored oil is probably made by boiling the kernels previous to expression, the cold-drawn oil being colorless, inodorous and nearly tasteless. The latter, according to Cloëz ("Compt. Rend., 1875, vol. 81, p. 469), has the spec. grav. 0.9362, congeals at —18° C. to a transparent mass, solidifies rapidly when exposed to light in a closed vessel, and is the most drying oil known. It is used in skin diseases, for ulcerated wounds and carbuncles, for varnishing furniture, all kinds of wood work, umbrellas, paper and paper leather, and for painting and caulking junks.—Ibid., p. 637.

Baillon names the tree Aleurites cordata, and mentions as synonyms *Dryandra Cordata*, Thunberg, *D. vernicia*, Correa, and *Elæococca vernicia*, Sprengel.—Am. Jour. Phar., July 1885, 354.

CARBOHYDRATES.

Wood—Distructive Distillation.—Some comparative results in respect to the dry distillation of wood are communicated by Mr. Senff. The points worked out are a comparison of the products of distillation under similar conditions yielded by wood from various parts of the same trees, and from the same wood in a healthy and in an unsound state; also a comparison of the products from one and the same wood distilled slowly and distilled rapidly. It has been found that when distilled similarly the yield by weight of crude acid, tar, charcoal and gas from the most diverse species of wood does not essentially differ, but that the percentage of real acid in the crude acid obtained differs considerably, and in this respect the wood from ordinary foliage trees compares favorably with that from needle-leaved trees; also that stem-wood yields more acid than branch-wood, that wood yields more acid than bark, and that sound wood yields more acid than unsound wood. In the comparison of slow with rapid carbonization, it was found that when the operation is conducted rapidly more uncondensed gas is produced, at the cost of both the total distillate and of the charcoal; that the distillate is considerably weaker in acid, and that the charcoal is much more hygroscopic than when the distillation takes place slowly.—Ber. d. Deutsch. Chem. Ges. xviii., 60, Phar. Jour. and Trans., Feb. 28, 1885, 696.

Starches—Typical Forms.—Mr. A. Tschirch contributes a paper in which he has endeavored to characterize the more important starches according to their typical (and adventitious) forms. He considers it remarkable that hitherto there has been no attempt made to separate the adventitious forms of a starch from the typical form, inasmuch as nearly all starches are found to consist not of a single form, but are a mixture of various forms, differing in shape and size. Thus, for instance, potato starch does not consist exclusively of the well-known, large, irregularly-rhombic granules, but contains, beside these, oval, somewhat smaller ones, as well as round and very small roundish granules. Nevertheless, the identity of such starch is readily recognized by competent microscopists, because the typical forms of these different granules are perfectly characteristic. The author gives numerous examples, accompanied by illustrations, and closes with a very extensive table, showing the chief variation from the type in the instance of the starches and meals of beans and pease.—Arch. d. Pharm., Dec. 1884, 921–936.

Saccharose—Synthesis.—It is announced that the synthesis of saccharose has just been accomplished by Messrs. Aubert and Giraud, and it is naturally anticipated that the discovery may eventually be of vast importance to the sugar industry. The process consists essentially in submitting amylaceous matter, after it has been converted into glucose in the usual manner, to the action of an electric current equal to about 75 volts, furnished by a Meriten's machine. The electrodes, consisting of antimoniated lead plates, are immersed in the solution, and the current is reversed from time to time. In the author's experiment, the reaction was terminated in about ten hours, and the end was indicated by the liquid no longer giving the characteristic color with tincture of iodine or a precipitate with alcohol. The liquid was afterwards defecated by means of lime, which was subsequently removed by carbonic acid, and the syrup was then decolorized and left to crystallize. The crystallized product, upon analysis, yielded 88.38 of saccharose, 1 of glucose, 3.67 of ash, and 6.95 per cent. of water. It was, therefore, far from being pure cane sugar. At present it has not been decided whether the reaction consists in the dehydration of glucose, the union of a molecule of dextrine with one of glucose, or the hydration of dextrine.— L'Union Pharm., Dec. 1884, 552; Pharm. Jour. and Trans., Dec. 27, 1884, 503.

Glucose.—Proper condition of *Alkaline Solution of Copper*, which see under "Inorganic Chemistry."

Gallisin—The Unfermentable Constituent of Commercial Glucose.—Neubauer and other authors have stated that in wine, which in its preparation has been subjected to Gall's treatment with glucose and fermented, a certain portion of the glucose remains in the wine as an unfermented substance which is neither glucose nor dextrin. Owing to the interest that has arisen as to the possible unwholesomeness of gallisated wines, Messrs. C. Schmitt and A. Cobenzl have been led to investigate the subject, and have succeeded in separating from fermented glucose (prepared from potato-starch) an intensely hygroscopic substance which they have named *gallisin*. This was prepared as follows: A solution of 5 kilos. of glucose was fermented at 18–20° for five or six days with yeast and filtered. The solution thus obtained was then evaporated to a thick syrup on the water-bath, and shaken in a flask with a large excess of absolute alcohol; it became thicker, but did not mix with the alcohol. After a second treatment with absolute alcohol (by means of which water, sugar, organic acids, etc., are extracted) the syrup was found to be converted into a crumbling yellow-gray mass, which by pounding in a mortar with a mixture of absolute alcohol and ether can be obtained as a gray powder. This powder may be purified by dissolving it in water, repeating the above treatment, and drying over sulphuric acid.

Gallisin when viewed under the microscope is found to be amorphous and without any characteristic structure. It is intensely hygroscopic, more so than calcium chloride, but yields no definite compound with water. It is insoluble in ether, chloroform, and benzene, very sparingly soluble in glacial acetic acid and in absolute alcohol, but slightly more so in methyl alcohol, and in this it differs from glucose, which is readily soluble. It dissolves when boiled in a mixture of glacial acetic acid and absolute alcohol, but it is precipitated from this solution by ether. In concentrated aqueous solution, it has an acid reaction to litmus-paper; and undergoes no change, either by heat or when treated with lead actate, mercuric nitrate or chloride, ferric chloride, tincture of iodine, or calcium or barium chloride. Barium hydroxide precipitates a small quantity of a white barium compound. With silver nitrate, it undergoes no change until it is heated or ammonia is added, when metallic silver is precipitated. It rapidly reduces potassium permanganate, especially in slightly alkaline solution, with separation of peroxide of manganese. Potassium dichromate in dilute acid solution is also rapidly reduced. Fehling's and Knapp's solutions are reduced by it (in this it differs from dextrin), and 0.05 g. glucose is equal to 0,109784 g. gallisin in reducing power. A concentrated solution of gallisin prevents the precipitation of iron salts by ammonia or caustic alkalies. With acetic anhydride, it gives an acetyl compound, and it is converted into glucose by treatment with dilute mineral acids on the water-bath. On treating an aqueous solution with fresh yeast it is not fermented, nor does it undergo lactic fermentation, but if a dilute aqueous solution is allowed to stand for a time it decomposes with formation of a mouldy fungus. At 100° it gives off water and carbonic anhydride. It has a slightly sweet taste at first, but in time becomes insipid. A solution of gallisin turns the plane of polarization to the right, and this power increases according to the dilution of the solution. A very pure white specimen, when analysed with every care to prevent access of moisture, was found to contain 43.50 per cent. C and 7.36 per cent. H, and these results lead to the formula $C_{12}H_{24}O_{10}$ (C, 43.9: H, 7.32).

When heated with an equal weight of oxalic acid at 103° for two hours, a portion of gallisin is converted into glucose, but the whole cannot be so converted, the substance becoming yellow by prolonged heating, and smelling strongly of caramel.

The authors, furthermore, describe *Gallisin-barium* ($C_{12}H_{22}BaO_{10}+3\ H_2O$), *gallisin-potassium* ($C_{12}H_{22}KO_{10}$), and *hexacetylgallisin* ($C_{12}H_{16}O_{10}Ac_6$), and describe the action of heat and of oxidizing agents upon the new substance.—Amer. Jour. Phar., Jan. 1885, 42–45; Ber. d. Deutsch., Ch. Ges. xvii., 1000–1015; Jour. Chem. Soc., Oct. 1884, 981–983.

Sugar—Formation in Beet Root.—Girard shows by new assays that the formation of sucrose takes place in the margin of the leaves through the influence of the sunlight. During the night the sugar passes into the root, so that in the morning the leaf margins are free from sucrose, but retain a uniform quantity of reducing sugar.—Amer. Jour. Phar., April 1885, 171; from Journ. de Fabr. de Sucre, 1884, pp. 25, 48; Chemiker Ztg., 1885, p. 3.

Sugar—Process of Refining by Means of Acetic Acid.—Mr. A. Wernicke describes a process for refining sugar and molasses by means of acetic acid. Pure sugar scarcely dissolves in concentrated acetic acid, whilst all the impurities of cane-sugar are readily soluble in it. In the present process, dry cane-sugar is heated at about 70° in closed vessels, with 50 to 70 per cent. of its weight of concentrated acetic acid, or molasses concentrated to 45 to 50° B., with 75 to 90 per cent. When cool, the acetic acid is poured off, and the sugar machined and dried, when it is ready for the market. The acetic acid is recovered by distillation.—Amer. Drug., Dec. 1884, 238; from Bied. Centralbl.

Sugar—Estimation in Wines.—According to J. Nessler and M. Barth, in order to estimate sugar in wines by Fehling's solution, the tannin must first be removed by lead acetate, the excess of lead being removed by sodium carbonate. Ordinary fully fermented wine usually contains under 0.1 per cent. sugar, and may be decolorized by a small quantity of animal charcoal; after rendering it alkaline with a little caustic alkali or carbonate, 5 cc. it is warmed with 2 cc. Fehling, in a water-bath. If the blue color completely disappears the wine contains over 0.2 per cent. sugar. If the blue color persists, 5 cc. more wine may be added, and the warming repeated. In this way an approximation to the amount of sugar may be made.—Amer. Jour. Phar., Sept. 1884, 482; from Dingl. Polyt. Jour.

Caramel—Detection in Alcoholic Liquids by Means of Paraldehyd.—Dr. C. Amthor finds that an alcoholic liquid containing caramel (rum, cognac, whiskey, wines), gives, on the addition of sufficient paraldehyd, a brown precipitate, and becomes decolorized. Minute quantities of caramel may be detected as follows:

Mix 10 cc. of the liquid in a suitable tall vessel, or white glass medicine bottle, with from 30 to 50 cc. paraldehyd (according to intensity of color) and enough alcohol to obtain a uniform mixture; wine requires about 15 or 20 cc. of alcohol. After 24 hours, caramel will show its presence by a brownish to dark brown sediment, which adheres to the bottom; after washing it with a little absolute alcohol, dissolve the sediment with hot water, filter, and evaporate to 1 cc; this residue will give an indication of the quantity of caramel present.—Amer. Jour. Phar., April 1885, 171; from Zeitschrift f. Analyt. Chemie, 1885.

Sugar of Milk—Manufacture in Switzerland.—Mr J. Kunz has communicated a very interesting paper on the manufacture of sugar of milk in Switzerland. The paper embraces,

(1) The Chemistry and Commerce of Milk-Sugar.
(2) The Manufacture of Crude Milk-Sugar, or "Sugar-sand."
(3) The Refineries of Milk-Sugar.
(4) The Refining of Milk-Sugar.

The author's paper, which is accompanied by several illustrations, may be consulted in Amer. Drug., Sept. 1884, 161–163.

Mannitol—Occurrence in Pineapples.—Mr. L. Lindet, in the course of the analysis of pine-apples from Pernambuco and Brazil, isolated crystals of mannitol; the quantity obtained was equal to more than 1 per cent. of the fresh fruit. The identity of the crystals with mannitol was established by combustion, crystalline form, solubility, and absence of rotatory and cupric oxide reducing power.—Amer. Jour. Phar., Sept. 1884, 477, from Bull. Soc. Chim. [40], 65, 66.

Perséite.—A mannite-like substance hitherto believed to be identical with mannite, from *Laurus Persea*, which see under "Materia Medica."

ORGANIC ACIDS.

Acetate of Magnesium—Use as an Efficient Substitute for the Citrate, etc.—Mr. A. F. W. Neynaber, Sr., draws attention to acetate of magnesium, which he recommends for the preparation of laxative elixirs, and as a substitute for citrate of magnesium. The compound, which is soluble in alcohol as well as water, is made by saturating a definite quantity of magnesia or carbonate of magnesium with acetic acid.—Amer. Jour-Phar., Sept. 1884, 471, 472.

Acetone—Occurrence of an Alkaloidal Substance in the Commercial Article.—Having in some researches upon vegetable alkaloids substituted acetone for alcohol in the exhaustion of the crude material, Mr. Schlagdenhauffen states that he was surprised at not always getting concordant results with the two solvents, the final results of the operation upon an acetone extract sometimes yielding alkaloidal compounds that were not obtained from an alcoholic extract. He was, therefore, led to distil some samples of commercial acetone, and obtained a yellow brown residue with alkaloidal properties, and resembling the ptomaines in their physiological action. It was partially soluble in water, and the remainder was dissolved in hydrochloric acid, both solutions giving similar precipitates with alkaloidal reagents.—L'Union Pharm., Aug. 1884, 356; Phar. Jour. and Trans., Aug. 30, 1884, 163.

Formic Acid—Antiseptic Action.—Mr. J. B. Schnetzler makes the observation that formic acid is fatal to *Bacterium subtile*, one of the microbes most difficult to kill. He states that after resisting for an hour the action of boiling water, this bacterium may be killed instantaneously by formic acid, it being sufficient for this purpose to add a drop of water containing $\frac{1}{1000}$ part of formic acid to a drop of water teeming with thousands of the bacteria. The fluid so treated may be introduced into the digestive tract with impunity. The author recommends that the action of formic acid should be tried on the *cholera bacillus*, and suggests that its action on *Bacillus anthrax* is equally deserving of experiment.—Pharm. Jour. and Trans., Aug. 30, 1884, 163; Compt. Rend., xcix., 226.

Butyric Acid.—Occurence in the wood of *Eperua falcata*, which see under "Materia Medica."

Benzoic Acid from Benzoin—Accompanying Substances.—Mr. O. Jacobsen finds that on treating benzoic acid from benzoin with sodium carbonate solution, an oil is left undissolved, smelling of vanillin and also of phenol. By fractionation it may be separated into three principal portions boiling at 200–210°, 235–245°, and 280–330°, and a pitch-like residue not further examined. The first fraction consists of methyl benzoate and guaiacol, which can be separated by treatment with cold dilute caustic soda. The second and smaller fraction, when shaken with water, gives up catechol in the aqueous solution; the portion insoluble in water and dilute alkalies is acetylguaiacol. The third and largest portion consists of an oil insoluble in dilute alkalies, which by saponification with alcoholic potash and subsequent treatment with water and ether yields benzyl alcohol and benzophenone, whilst the aqueous solution contains guaiacol and benzoic acid; this fraction therefore contains benzyl benzoate, benzophenone, and benzoylguaiacol. The oil also contains vanillin, but in minute quantity only. The medicinal value of sublimed benzoic acid is attributed to the catechol and guaiacol; it is believed that of the above bodies only vanillin and benzyl benzoate exist ready formed in the gum. Benzaldehyde may be formed by the oxidation of the contained benzyl benzoate, so that the production of the former cannot be considered as a proof of adulteration with cinnamic acid. Schlickum and Schneider have tested the genuine nature of natural benzoic acid by its reducing boiling ammoniacal silver solution; but catechol will reduce the solution in the cold, and the author therefore suggests the following method of testing: Convert the benzoic acid into the sodium salt, and, after drying, shake with ether; after removal of the ether, the residue may be dissolved in water, and the above or any other tests for catechol applied.—Arch. Pharm. [3], xxii., pp. 366–374; Jour. Chem. Soc., Nov. 1884, p. 1168; Amer. Jour. of Phar., Jan. 1885, 28.

Benzoic Acid.—Possible formation by the splitting up of a new body in *Siam Benzoin*, which see under "Materia Medica."

Benzoate of Sodium—Determination of Source.—Dr. Hager gives the following direction for distinguishing benzoate of sodium made from benzoin-benzoic acid from that made with artificial or toluol-benzoic acid.

Evaporate a few drops of $\frac{1}{100}$ per cent. solution of the benzoate in alcohol of 60% upon a microscope slide between 20° and 25° C. If the benzoic acid was derived from benzoin, the glass will be found, with a magnifying power of one hundred to two hundred diameters, to contain convex heaps of crystals, from the edge of which here and there small crystalline rays may project. If the benzoic acid was derived from other sources, the object-glass contains crystalline groups in which those convex heaps form the base, but instead of crystalline rays, thev send forth handsome, curved, feathery bunches, which exceed the heaps by two or three times their length. The whole field represents a crystalline group, since the feathery bunches coalesce.—Amer. Drug., July 1884, 132; Pharm. Centralh.

Borobenzoate of Sodium—Formulas.—Mr. Thomas S. Wiegand, having had occasional prescriptions for borobenzoate of sodium and, being unable to find a formula in the commoner treatises on chemistry, obtained the following formulas from friends who had used them, and offers them for publication:

For making the salt (said to be taken from "Johnson's Medical Formulary"):

Take of Borate of sodium	3 oz.
Benzoate of sodium	4 oz.
Water, sufficient to dissolve.	

Make a solution of the salts in the water, and evaporate, with constant stirring, to dryness. One-sixth of these proportions yields an ounce.

Or,

To a hot solution of borax add benzoic acid sufficient to saturate it, and evaporate to dryness.

The latter formula would seem preferable. The salt is prescribed in 12 or 15-grain doses, given with tonics.—Amer. Jour. Pharm., Dec. 1884, 615.

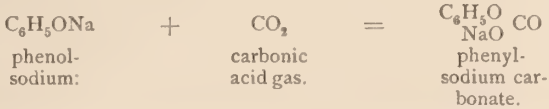
Cinnamic Acid—Preparation.—Mr. Edw. Classon recommends the preparation of cinnamic acid from storax as follows: Storax is boiled with solution of carbonate of sodium, the mixture is allowed to cool, and hydrochloric acid is added to neutralize the greater portion of the excess of alkali, leaving the mixture react faintly alkaline. It is then again boiled, allowed to cool, and filtered, the residue or the filter being washed with water. The filtrate and washings are concentrated if necessary, and precipitated with excess of hydrochloric acid; the precipitate is collected on a filter, washed with a little water, and dried. The crude cinnamic acid so obtained is purified by crystallization from hot benzin; hot benzin being poured through the filter, and the crystals of cinnamic acid collected after the cooling of the solution. The mother liquors, being again heated, are poured on the cinnamic acid remaining in the filter, and the pure cinnamic acid crystallizing out collected as before, this being repeated until all the cinnamic acid has been crystallized. The last portion may require recrystallization.

Benzoic Acid may be prepared in the same manner from benzoin.—Pharm. Rundschau, Sept. 1883, 193.

Salicylic Acid—Improved Process of Manufacture.—A new process for the preparation of salicylic acid has been discovered by Dr. Rudolph Schmitt, who, it seems has disposed of it to the owners of Kolbe's process. The new process is described as follows:

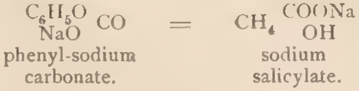
The dry phenolates (or carbolates) of alkalies and alkaline earths, prepared by acting with carbolic acid upon these substances in a caustic state, are exposed at ordinary temperature to a current of carbonic acid gas until the latter is no longer absorbed. This causes the formation of a double carbonate of phenyl (C_6H_6) and of the alkali metal, for instance, with sodium:

Phenyl-sodium carbonate:



$$\begin{array}{ccccc} C_6H_5ONa & + & CO_2 & = & \begin{matrix} C_6H_5O \\ NaO \end{matrix} CO \\ \text{phenol-sodium:} & & \text{carbonic acid gas.} & & \text{phenyl-sodium carbonate.} \end{array}$$

On heating the latter salt for a few hours, in a closed vessel, to 120–140° C., a molecular re-arrangement takes place in the salt, without the separation of any phenol, thus:



$$\begin{array}{ccc} \begin{matrix} C_6H_5O \\ NaO \end{matrix} CO & = & CH_4 \begin{matrix} COONa \\ OH \end{matrix} \\ \text{phenyl-sodium carbonate.} & & \text{sodium salicylate.} \end{array}$$

Upon opening the vessel no pressure is noticed, and the absolutely dry, powdery salicylate need only be dissolved in water, the salicylate acid separated by the addition of a mineral acid, and purified by re-crystallization, sublimation, or dialyzation in the usual manner.—Amer. Drug., Mar. 1885, 44.

Salicylic Acid—Influence on Alcoholic Fermentation.—The experiments of G. Heinzelmann show that the vitality of yeast is completely destroyed by the presence of 0.15 gram of salicylic acid per 400 cc. of sugar solution, whilst the addition of 0.01 per cent. favors its greatest activity and, although the yeast plant does not propagate, nevertheless the cells developed in the presence of salicylic acid are stronger and larger than those produced in a solution free from that acid. Moreover, under similar circumstances the production of alcohol in a given time is greater. The addition of 0.1 gram of salicylic acid per litre of "mashing" favors fermentation, especially with pure sugar solutions.—Amer. Jour. Phar., Nov. 1884, 596; from Bied. Centr.

Salicylate of Sodium—Absorption of Carbonic Acid.—Dr. Schweissinger has made some experiments to determine the cause of turbidity which is sometimes observed in solution of salicylate of sodium through the evolution of a multitude of small gas bubbles. He confirms the opinion of Dr. Hager, that the gas given off is carbonic acid, but is of opinion, from examination of specimens of salt exhibiting this phenomenon, that the carbonic acid does not arise from decomposition of the salt, but has been absorbed by the salt from the atmosphere. In one case the quantity of absorbed carbonic acid was estimated to amount to 0.033 per cent. by weight of the salt. The observation points out the necessity to keep the salt in well-closed vessels.—Pharm. Post, xvii., 1082; Phar. Jour. and Trans., Dec. 27, 1884, 502.

Salicylate of Sodium—Formation of Stable Solution.—G. M. Markovich recommends adding gradually 60 gm. of sodium bicarbonate to 100 gm. salicylic acid, and 225 gm. water, contained in a flask; when effervescence ceases, warm; then pass through a previously washed filter, and add 1000 gm. of distilled water. This gives a solution containing 10 per cent. of the salt.—Phar. Post, 1885, p. 273; Amer. Jour. Phar., June 1885, 292.

Salicylate of Bismuth—Variable Composition.—Prof. Schmitt draws attention to the variable composition of commercial salicylate of bismuth. Samples derived from different sources were examined as to their yield of oxide of bismuth. One German sample yielded 65 per cent. of Bi_2O_3, and corresponded to the basic salt in composition. A sample of French manufacture, sold as containing 73 per cent. Bi_2O_3, contained only 42 per cent. Another sample of German manufacture gave only 35 per cent. Bi_2O_3, representing neutral salicylate; upon treatment with alcohol it was converted into a soluble acid salicylate and an insoluble basic salicylate. It was noticed that the bismuthic oxide obtained by calcination of the salicylate was very fusible, in which respect it differs markedly from that derived from the subnitrate. The author concludes by pointing out that whereas in the subnitrate of bismuth the therapeutist derives a salt rich in nitric acid, in the salicylate it is the bismuth radical which is most important, so that a basic salt should be preferred.—Phar. Jour. and Trans., May 2, 1885, 889; Rép. de Pharm., Mar. 1885, 98.

Citric Acid—Determination of Absence of Tartaric Acid.—Pusch recommends a method for the detection of tartaric in citric acid, which he says is simple, clear, and certain. It consists in adding to 1 gram of powdered citric acid in a dry test tube 10 grams of strong, pure (colorless) sulphuric acid, and keeping the tube containing the mixture immersed in boiling water for an hour. The citric acid dissolves with evolution of gas and frothing to form a lemon-colored liquid, and if the sample be pure this color undergoes no change within half an hour; but if as much as one-half per cent. of tartaric acid be present, the lemon color becomes brownish within that time, and in an hour the mixture is reddish-brown.—Phar. Jour. and Trans., Feb. 28, 1885, 693; Arch. d. Pharm. (3) xxii., 316.

Ammonio-Citrate of Iron—Percentage of Ferric Oxides in Commercial Samples.—Mr. R. Wright, in the course of experiments to devise an easy and reliable method of estimating volumetrically the amount of iron in scale preparations, found incidentally that the percentage of iron in the ammonio-citrate of commerce is higher than that claimed by either the U. S. or British Pharmacopœia. Six commercial samples yielded respectively 31.7, 44.0, 40.5, 36.7, 33.9, and 32 % of residue on incineration. The British Pharmacopœia, which directs an excess of citric acid, requires that on incineration "at least 27 per cent. of peroxide of iron" shall be yielded, whilst the U. S. Pharmacopœia requires 25 per cent. Specimens prepared by the B. P. process on a small scale gave 27.3 % of residue; but when made by adding ferric oxide to complete saturation of the acid, the residue amounted to over 30% (average 30.3). This residue is not all peroxide of iron, but probably contains magnetic oxide as well. —Phar Jour. and Trans., March 7, 1885, 731, 732.

Citrate of Iron and Quinine—Improved Formula.—Mr. R. Rother reviews the officinal formula for their compound, and expresses the opinion that it is an indefinite mixture of ferric hydrocitrate, ferric citrate, and an undetermined quinio-ferric citrate, held in some kind of chemical union by the two former salts. He advocates, in order to secure a compound of constant and definite composition, the use of *anhydrous quinine* (see under "Alkaloids"), and gives the following formula:

Ferric citrate	8.16	grams.
Citric acid	2.10	"
Sodium bicarbonate	1.68	"
Quinine trihydrite	3.78	"

or,

Quinine anhydrite.	3.24	grams.
Water sufficient.		

Place the ferric citrate, sodium bicarbonate and 20.00 cc. of water in a porcelain capsule of convenient size and apply heat, constantly stirring the mixture until perfect solution has resulted. Now place the quinine, citric acid and 20.00 cc. of water into a similar capsule, and apply heat whilst stirring the mixture, until the combination is completed. Pour the solution into this magma, apply heat, and when all has dissolved, evaporate the solution at a moderate temperature, to a syrupy consistence, and spread it on glass plates to dry in the warm open air, so that the salt may form in scales.—Amer. Jour. Phar., March 1885, 121–126.

Tartaric Acid—Estimation in Wines.—J. Nessler and M. Barth give a method for estimating free tartaric acid in wine, as an improvement of the original Berthelot-Fleurieu's process. 50 cc. of wine are evaporated to thin syrup, this is well shaken with 70 cc. of 96 per cent. alcohol, and allowed to stand four hours in a cool place, to permit the tartrate to settle out. The precipitate is separated, and its acidity reckoned as tartrate. The filtrate is freed from alcohol, and 0.5 cc. of acidified 20 per cent. solution of potassium acetate is stirred into the syrupy residue, and the newly formed tartrate is estimated as before. But this method fails in case of wines strongly plastered, although negative values cannot be obtained, as are sometimes got by the older method.— Amer. Jour. Phar., Sept. 1884, 482, from Dingl. Polyt. Jour.

Tartrate of Calcium—Valuation.—According to L. Weigert, 5 grains of the finely-powdered substance are heated with 30 cc. of a ten per cent. potassium carbonate solution for two hours, the solution is filtered, concentrated to 5 cc., and mixed with an equal amount of strong acetic acid, and 100 cc. of 90 per cent alcohol. After a few hours' standing, the hydrogen potassium tartrate is separated, washed with alcohol, and titrated with standard alkali. If calcium carbonate is present at the same time, and this has to be estimated, ordinary volumetric methods cannot be employed, and the carbonic acid has to be determined directly by Scheibler's apparatus or some similar method. —Amer. Drug. March, 1885, 49; from Zeitschr. f. Anal. Chem., 1884, 357.

Picric Acid—Detection in Iodoform.—Dr. J. Biel reports a sophistication of iodoform with picric acid, for which purpose it is adapted, owing to its yellow color, crystalline structure, melting point, solubility in alcohol and ether, and its cheaper price. On trituration in a mortar it is apt to explode. On agitating iodoform with distilled water and filtering, the filtrate should be colorless, not yellow, and on the addition of solution of potassium cyanide no change should be produced, while in the presence of a trace of picric acid the liquid acquires within ten minutes a brown red color, due to the formation of isopurpuric acid, and subsequently a brown red precipitate of sparingly soluble potassium isopurpurate.—Amer. Jour. Phar., Nov 1884, 598; from Phar. Zeitschr., f. Russl., 1884, 301.

Picric Acid.—Use for the detection of *Cyanogen*, which see under "Inorganic Chemistry."

Picric Acid.—Value as a test for *albumen* in urine. See under "Albuminoids."

Koussinate of Sodium—Preparation.—Pavesi recommends the following process: Mix the powdered kousso with lime, exhaust with alcohol and then with boiling water; mix, recover the alcohol, precipitate the koussin with an excess of concentrated acetic acid, wash, dry the precipitate, and decolorize by dissolving in boiling alcohol and treating with animal charcoal. Put a portion of the koussin in a capsule containing very hot water, and add crystallized carbonate of sodium until complete solution has been effected. Boil for a few minutes with animal charcoal, filter, and evaporate at a moderate heat. The sodium koussinate is an amorphous, pulverulent mass, of a yellowish white color, little hygroscopic, soluble in cold and more so in warm water and alcohol.—Amer. Jour. Phar., May 1885, 239; Journ. de Pharm. d' Alsace-Lorraine, No. 3, 1885.

Shikiminic Acid.—A new acid from the fruit of *Illicium religiosum*, which see under "Materia Medica."

Crescentinic Acid.—A new acid from *Crescentia Cujete*, which see under "Materia Medica."

Chebulinic Acid.—A new acid from *Terminalia Chebula*, which see under "Materia Medica."

Chrysophanic Acid.—Occurrence as chrysophan in *Rhubarb*, which see under "Materia Medica."

Chrysophanic Acid.—Occurrence in the bark of *Rhamnus Purshiana*, which see under "Materia Medica."

Caffeic Acid—Isolation from the Mother Liquors of Coniine and Conydrine.—In view of the unmistakable resemblance, both in composition and behavior, between conydrine and tropine, the question presented itself to Prof. A. W. Hoffman whether the former might not, like the latter, exist in the plant organism in combination with an acid, and whether there might not occur in the hemlock a compound corresponding to atropine in belladonna, which with the elements of water would yield an hydrine and an acid, just as atropine under the same conditions is converted into tropine and tropic acid. The author has now obtained from the establishment of Mr. W. Merck a consignment of a crystalline compound having acid properties which had been obtained from the alkaline liquor left after distilling over the coniine and conydrine, by first supersaturating it with an acid, and then treating it with ether and evaporating the ethereal solution. This, after purification, was found to present the characters used to have the composition of caffeic acid, $C_9H_8O_4$.—Ber. d. D. Chem. Ges. xvii., 1922; Phar. Jour. and Trans., Nov. 1, 1884, 342.

Tannin—Function in Plants.—Mr. E. Kutscher has made investigations on the function of tannin in plants. Investigations were made with *Vicia faba*, *Helianthus tuberosus* and *annuus*, *Ricinus sanguineus* and *Phaseolus multiflorus*, plants well adapted for the purpose, as they were found to be typical examples of the different locations of tannin; inasmuch as it is distributed throughout the plant in the *Vicia* and *Helianthus*, whilst it is only local and inactive in the *Ricinus* and *Phaseolus* plants. In the last two species tannin is not found in the top of the plants, nor in the cell-walls, nor in the general sap during the period of vegetation; moreover, it is never equally distributed throughout the tissue-complex, but is confined in separate secluded cells, where it, at the most, changes to a red coloring matter without being used in the general development, whilst with the *Vicia* and *Helianthus* tannin is found in all the tissues soon after germination, but disappears with the formation of organs. *Vicia* tannin is iron-green, *Ricinus* iron-blue. Tannin apparently takes part in the formation and primary differentiation of the tissues, but does not take part in the further growth of the cell-walls; the most feasible use attributed to this substance is in aiding respiration.—Amer. Jour. Phar., Sept. 1884, 477; from Bied. Centralbl.

Tannin—Determination of Commercial Quality.—Mr. T. Maben has determined the percentages of tannic acid in commercial tannin, selecting for this purpose Löwenthal's method, which consists in titrating a portion of the tannin solution with permanganate, and another portion with the same oxidizing agent, after having removed the tannic acid by means of gelatine. This second determination represents the oxidizable matter in the commercial tannin that is not tannic acid, and the difference between the two titrations gives the amount of absolute tannic acid in the commercial sample. The author adopted the co-efficients of Neubauer and Oser, according to which one gram of pure gallo-tannic acid requires for oxidation 0.759 grams of permanganate of potassium. The results are given as follows:

	Permanganate of potassium required to oxidize 1 gram tannin.			Tannic acid, per cent.	Oxidizable matter other than tannin (by difference.)	Moisture.	Relative weight, highest being 10.	One part tannin soluble in parts of water at 60°.
	Before precipitation.	After precipitation.	Difference.					
1	0.733	0.0586	0.6744	88.8	6.2	5.0	12	1
2	0.679	0.0192	0.6598	86.9	5.1	8.0	10	1
3	0.4737	0.0601	0.4136	54.4	40.6	5.0	25	1
4	0.5015	0.0694	0.4321	56.9	36.1	7.0	28	1.5
5	0.6173	0.0108	0.6065	79.9	14.1	6.0	10	2
6	0.6172	0.0308	0.5864	77.2	15.8	7.0	12	1.5
7	0.6913	0.0663	0.6250	82.3	14.3	3.0	24	3
8	0.5091	0.0555	0.4536	59.7	37.3	3.0	41	1
9	0.5756	0.0385	0.5371	70.7	25.3	4.0	30	1.5

The samples were those of London, Edinburgh, and German manufacturers in almost equal proportions, and may therefore be taken to be fairly representative. In general appearance they vary considerably, some being crystalline or scaly (Nos. 1 and 5 especially so), while others are almost destitute of scales. They are for the most part of a light or pale straw color, only one, No. 1, being of a perceptibly darker shade. Their relative weights were approximately determined. So far as the author has gone, the solubility of the tannin seems to bear no relation to the percentage of tannic acid. The rapidity of solubility, as determined by shaking 10 grains of each sample with 1 ounce of water, was as follows: No. 1 dissolved in half a minute, 5, 6, and 8 in two minutes, 2 and 9 in three minutes, while 3, 4 and 7 were only partially dissolved in fifteen minutes. The residue in 3 and 4 dissolved at once on the solution being heated to 80° F., while that in No. 7 still remained undissolved. Nos. 2, 5, 6, and 8 were clear, 3 and 4 slightly muddy, 1 and 9 still more so, and 7 most of all. The insoluble matter in the last was of a resinous nature, but apparently quite small. All the samples were readily soluble in alcohol: No. 2 disappeared instantaneously, 1, 5, 6 and 7 very rapidly and 3, 4, 8 and 9 somewhat slowly. The moisture was determined by drying *in vacuo* over sulphuric acid, it having been found impossible to obtain constant weighings in the usual way. All of the samples were free from ash with the exception of No. 7, which gave 0.4 per cent.—Phar. Jour. and Trans., April 18, 1885, 850–852.

Iodized Tannic Acid.—Use as a reagent for *salts having an alkaline reaction,* which see under "Inorganic Chemistry."

ORGANIC BASES.

Alkaloids—Influence of the Deposits formed in their Solutions.—Mr. Barnouvin has made some experiments to determine whether the deposits which form in solutions of alkaloids, and their salts decompose or modify the dissolved alkaloid. He prepared solutions of sulphate of atropine and hydrochlorate of morphine in rose-water, containing 3 parts in 1000, and kept them during two months, at the end of which time they manifested considerable flocculence. They were then filtered, and 10 cc. of each evaporated, when the residue from the solution of sulphate of atropine weighed 0.033 gram, and from the solution of hydrochlorate of morphine 0.032 gram. These figures agreeing very closely with the quantity of each salt used, and the alkaloids having preserved their characteristic properties, the author concludes that the development of flocks in solutions of alkaloids does not exercise any influence upon their therapeutic properties.—Phar. Jour. and Trans., Nov. 29, 1884, 422; Bull. Comm., Oct. 1884, 484.

New Alkaloids.—An unusually large number of new alkaloidal substances have been announced during the year, as will be noted in the following:

An Alkaloidal (?) *Substance* has been isolated by Mr. M. S. Falk from *Cimicifuga racemosa*, which see under "Materia Medica."

A New Mydriatic Alkaloid has been isolated from *Bowdichia major*, which see under "Materia Medica."

Scopoleine.—A new alkaloid from *Japanese Belladonna Root*, which see under "Materia Medica."

Lycaconitine and *myoctonine.*—Two new alkaloids from *Acontium Lycoctonum*, which see under "Materia Medica."

Lappine.—A new alkaloid isolated from *Burdock fruit*, which see under "Materia Medica."

Galipeïne.—A new alkaloid from *Angustura Bark*, which see under "Materia Medica."

Menispine.—A new alkaloid from the rhizome of *Menispermum canadense*, which see under "Materia Medica."

Para-buxinidine.—A new alkaloid from *Buxus sempervirens*, Lin., which see under "Materia Medica."

Manacine.—A new alkaloid from *Franciscea uniflora* (Manaca) which see under "Materia Medica."

Parthenine.—Action of the alkaloid from *Parthenium Hysterophorus*, which see under "Materia Medica."

Phytolaccine.—A new alkaloid found in *Phytolacca decandra*, which see under "Materia Medica."

Mandragorine.—An alkaloid from *Mandragora officinalis*, which see under "Materia Medica."

Morphine—Estimation in Opium.—V. Perger reviews the methods of the Austrian Pharmacopœia, of Godeffrov and of Merck, and suggests the following improved method for the estimation of morphine in opium: 10 to 20 grams of the opium to be examined are boiled for a short time with 15 to 30 grams of caustic baryta and about 150 to 200 cc. water. The mixture is then filtered, and the residue repeatedly boiled with small quantities of water until the solution fails to give a reaction with molybdic acid and sulphuric acid. Excessive boiling is to be avoided, and as a rule the filtrate should not amount to more than 400–500 cc. A stream of carbonic anhydride is passed into this solution, which contains all the morphine, until the liquid is supersaturated, and then the whole is evaporated on a water-bath as quickly as possible. The residue is moistened with absolute alcohol, transferred to an Erlenmeyer's flask, and exhausted with successive quantities of boiling absolute alcohol until a sample evaporated on a watch-glass no longer gives a morphine reaction. This usually requires from 300 to 400 cc. alcohol. The alcohol is removed by distillation, and the residue left in the flask is allowed to stand for some time with 15 cc. of ammonia. It is next collected on a tared filter, dried at 40°, and treated repeatedly with chloroform. This is the crude morphine. It should be light-brown to straw-color. Crude morphine generally contains substances which can be classed under two heads, namely, (1) those which are insoluble in acetic acid; (2) those which are soluble, but which are reprecipitated by ammonia and potassium ferrocyanide. The author finds that the amount of the impurities is always small, and that the difference between the crude and the pure morphine is principally due to the loss of morphine in the process of purification. The following table gives the percentages of morphine found by employing the various methods. The impure products are marked thus*:

PERCENTAGE OF MORPHINE.

Opium.	E. Merck.	Austr.Pharm.	Godeffroy.	v. Perger.
I	. . . .	4.17*	1.63*	9.04
II	5.99	2.04*	0.507*	8.37
III	. .	. .	5.567	9.1
IV	9.32	0.253*	8.52	11.0
V	1.72	0.3*	1.17*	3.68
VI	13.57	?*	8.42	14.75

—Amer. Jour. Phar., Dec. 1884, 634–636; Jour. Prakt. Chem., (2) xxix., 97.

The editor of the Amer. Jour. Phar. observes that the extraction of morphine by *macerating* opium or its preparations with water and large excess of baryta was recommended by F. F. Mayer in Amer. Jour. Phar., 1863, page 387.

Morphine—Stability of Solutions.—A correspondent of the Phar. Centralhalle (No. 24) states that he has found solution of hydrochlorate of morphine to keep quite well, if made with doubly distilled water and with a morphine salt free from dust. The author has been in the habit of dissolving 10 gm. of the hydrochlorate in 200 cc. of twice-distilled water at a temperature not exceeding 35° C. (95° F.). Filtration is only performed when solid particles are seen to float about in the liquid.—Amer. Drug., Dec. 1884, 232.

Hydrochlorate of Morphine—Spontaneous Conversion (in solution) into Apomorphine.—Dr. Hager mentions that he recently had a solution of hydrochlorate of morphine brought under his notice concerning which the patient complained that a dose instantaneously injected had made him so ill that he had been confined to his bed during three days, and that there had been constant but ungratified desire to vomit. Dr. Hager found that eleven months had elapsed since the solution had been prepared, and that previous doses of the same solution had not produced any abnormal symptoms. Upon examination, the presence of a trace of apomorphine was determined, which had doubtless developed during the long keeping —Phar. Jour. and Trans., Mar. 28, 1885, 791; Phar. Centralh., Feb. 26, 1885, 93.

Apomorphine—Therapeutic Uses.—Dr. Weill has found that the hydrochlorate of apomorphine may be given with beneficial results in diseases associated with spasmodic action, such as hiccough, epilepsy and cholera. It must, however, be given in small doses—2 to 6 milligrams—and then it does not produce either nausea or vomiting.—Lancet, Dec. 27, 1884, 1166; Phar. Jour. and Trans., Jan. 31, 1885, 613.

Papaverine and Narcotine—Separation and Purification..—It is well known that when a syrupy, aqueous extraction of opium is treated with marble and chloride of calcium, the meconic acid, as meconate of lime, and the morphine and codeine, as hydrochlorates, are deposited from the solution on standing for some time. The mother liquor, upon the addition of ammonia, yields a precipitate which is principally composed of papaverine and narcotine, containing besides only small proportions of other alkaloids. It has been recommended to separate these two alkaloids by treatment with very dilute acetic acid, whereby the narcotine is said to remain undissolved. Mr. Edo Classen, however, finds that under these conditions considerable quantities of narcotine are also taken up, and he has therefore experimented to determine a more satisfactory method for their separation. After trying different methods, he finally adopted the following: The precipitate of mixed alkaloids is dissolved in boiling alcohol, filtered, and allowed to stand for some time, during which a good proportion of the narcotine will crystallize out. This is collected, washed with a little cold alcohol, and, the greater part of the alcohol being distilled off, the greater part of the remaining narcotine will crystallize out, leaving the papaverine in the mother liquor. The narcotine is purified by treatment with animal charcoal and recrystallization from alcohol, while the mother liquors containing the papaverine are evaporated to dryness, the residue dissolved in hot water by the aid of a decided excess of hydrochloric acid, the solution treated with purified animal charcoal, evaporated to syrup, and allowed to crystallize. It may be necessary to recrystallize the hydrochlorate from acidulated aqueous solution.—Pharm. Rundschau, Jan. 1885, 4.

Quinine—Effect of Contact with Lime.—In a recent communication to the "Journal de Pharmacie," Mr. Masse expresses an opinion that the lime used in the ordinary processes of cinchona bark analysis exercises an injurious influence upon the yield of alkaloid, especially at the temperature of the water-bath. This opinion he considers to have been confirmed by the results of some experiments made directly upon quinine sulphate. If this statement could be substantiated, it would be of considerable importance, as pointing to a loss of upwards of 11½ per cent. of alkaloid, and therefore constituting a source of serious error in the analysis of bark by methods ordinarily followed. In order, therefore, to test its accuracy, M. Masse's experiment was repeated by Mr. F. W. Passmore. 0.5 grams of pure quinine sulphate, containing 5.3% of water and equivalent to 0.411 gram of alkaloid, was dissolved in 25 cc. of a 2 per cent. solution of hydrochloric acid; to this solution 10 grams of lime was added, and the whole was dried at the temperature of the water-bath. The residue was finely powdered, introduced into a small glass percolator, and the alkaloid extracted with chloroform. After complete exhaustion of the mixture, the chloroform solution was carefully evaporated to dryness. The residue gave a weight of 0.409 gram of quinine alkaloid, or a deficit of two milligrams, which slight loss may be considered to be due to experimental error. In a subsequent experiment ether was employed in preference to chloroform as an extracting agent, as being less difficult of manipulation. The ether residue obtained was, to avoid impurities, redissolved in a slight excess of acid, and the alkaloid precipitated with ammonia and extracted with ether. This second ether solution upon evaporation left a residue of quinine alkaloid weighing 0.409 gram, or a deficit of 0.002 gram upon the 0.411 gram of alkaloid required by theory. This loss also may be considered due to experimental error, and both results are totally at variance with those obtained by M. Masse.—Amer. Jour. Pharm., June 1885, 294–295; Pharm. Jour. and Trans., April 11, 1885, 829.

Anhydrous Quinine—Preparation.—Mr. R. Rother recommends a process for preparing anhydrous quinine to be used in his formula for making "Citrate of Iron and Quinine" (which see under "Organic Acids"). Anhydrous quinine can be produced by heating together 8.72 grams or one m. of ordinary quinium sulphate, 5.72 grams or two ms of disodic carbonate, and about 50.00 cc. of water until perfect decomposition of the sulphate is effected. On cooling, the alkaline solution is decanted from the hardened mass. This is well rinsed with cold water and then successively digested with small portions of water until the fused quinine is thoroughly washed. The mass is now heated at a properly regulated temperature until a friable residue of anhydrous quinine, weighing nearly 6.48 grams, remains.—Amer. Jour. Phar., March 1885, 125.

Quinine and Morphine—Reactions.—Eiloart observes that quinine may be recognized even in very dilute solution (as low as 1 in 60,000) by adding to it successively bromine water, ferrocyanide potassium, and borax. The limit of recognition may be carried as far as 1 in 500,000, if the ferrocyanide of potassium is replaced by cyanide of mercury, and the borax by precipitated carbonate of calcium.

According to Bloxam, a rose-red color is produced if quinine is boiled with bromine solution; in this case the limit, in acid solution, is 1 in 15,000. If carbonate of calcium is added before the bromine, the limit rises 50,000. A strong solution, under these circumstances, turns violet in the cold, blue when heated, and becomes again violet on the addition of more bromine.

A neutral solution of quinine (1 in 50,000) boiled with an excess of bromine until the excess has been driven off, and then cooled, shows a fine green fluorescence.

Morphine, when boiled with excess of bromine water, yields a light-red solution, if the liquid is neutralized with carbonate of calcium, and then again boiled—provided the proportion of morphine is more than 1 in 1,200. If less is present, the liquid turns orange or brown, and becomes bleached by the addition of more bromine water.—Amer. Drug., Feb. 1885, 21; from Chem. News.

Commercial Sulphate of Quinine—Composition and Examination.—Dr.

W. F. Koppeschaar has examined commercial sulphate of quinine by three methods: 1st. By the herepathite method; 2d. By separation with ether; and 3d. By the optical method. He gives preference to the optical method as the most accurate, and gives specific directions as to its application. In all instances he found commercial sulphate of quinine to contain a considerable percentage of sulphate of cinchonidine, and he is inclined to the belief that to its presence must be attributed the variable statements and assumptions as to the amount of water of crystallization present in that compound—the quantity of water being given as 7, 7·5, and 8 molecules respectively. The latter is the quantity adopted by Hesse and by Flückiger, and was originally mentioned by Robiquet. The author now accepts this quantity as the correct one, the lower quantities being traceable to the circumstance that the sulphate of cinchonidine, which is invariably present in the commercial salt, contains only 6 molecules of water of crystallization. Furthermore, in cases where very low percentages of water are found, it is probable that a double salt is formed, which may also contain only 6 molecules of water. While the author is not prepared to insist that sulphate of cinchonidine should be excluded from commercial sulphate of quinine, he considers it proper that it should not exceed a certain and established percentage. It would be much better, however, to use the acid sulphate of quinine, as is now the practice in America, this sulphate being pure by nature, and to be preferred from a therapeutic point of view to the normal salt on account of its easy solubility.—Pharm. Jour. and Trans., April 4, 1885, 809–813.

Sulphate of Quinine—Medicinal Compatibility with Iodide of Potassium.—It has been suggested that when these drugs are prescribed together, or one a short time after the other, owing to their incompatibility, they will produce anorexia, nausea, even vomiting or colic. William Martindale writes to the "Brit. Med. Jour.," July 5, 1884, that such a mixture, with the addition of compound powder of tragacanth, is a favorite with a physician in large practice, yet he never heard any complaint about its effect. Chemically, their incompatibility will depend upon whether the normal sulphate of quinine is dissolved by diluted sulphuric acid added to the mixture or not. No decomposition will occur if the two neutral salts be mixed with water in a fairly diluted condition, in an ordinary dose.—Amer. Jour. Phar., Nov. 1884, 598.

Fluoride of Quinine—Use for Enlarged Spleen.—This compound of quinine has recently been recommended by Dr. Weddell, of Calcutta, in the treatment of enlarged spleen. He has investigated the action of fluoric acid and the fluorides, and has come to the conclusion that in cases of chronically enlarged spleens of malarial origin the effects obtained are often very striking. In very small doses the fluorides have produced marked benefit in cases of rickets and other diseases associated with malnutrition of the osseous system. Of the salts of fluoric acid, Dr. Weddell considers those of quinine or quinetum (*i. e.*, of the mixed cinchona alkaloids) to be the best.—Amer. Jour. Phar., Dec. 1884, 646; from Med. and Surg. Reporter.

Tannate of Quinine—Tasteless Preparation.—Mr. Peltz recommends the use of a solution (1:30) of hydrochlorate of quinine (in place of the sulphate), which is added to a solution of tannic acid previously neutralized with ammonia. After 24 hours the precipitate is collected, washed, and dried at a temperature not exceeding 30° C. The tannate thus obtained is a pale yellowish white amorphous powder, containing at least 20 per cent. of quinine, is soluble in 400 parts of cold water, in 50 parts of hot water, in 48 parts of cold alcohol, and in 3 parts of hot alcohol.—Amer. Jour. Phar., May 1885, 238; Phar. Zts. f. Russl., 1885.

Alkaloids of Remijia Purdieana—Characters.—Supplementary to his previous paper on the subject, Dr. O. Hesse communicates a lengthy paper on the alkaloids from the bark of *Remijia Purdieana*, from which the following may find place here: Besides *cinchonamine* and *cinchonine*, which have already been noticed by Arnaud, the bark contains several other alkaloids, viz., *concusconine*, *chairamine*, *conchairamine*, *chairamidine*, and *conchairamidine*. *Cinchonamine* and its salts have been to some extent described by Arnaud, whose results the author in general confirms, although differing in some details. *Cinchonamine*, $C_{19}H_{24}N_2O$, crystallizes in brilliant colorless needles, melts when anhydrous at 184 to 185° (194° Arnaud), is readily soluble in hot alcohol, ether, chloroform, carbon bisulphide, and benzene, sparingly soluble in light petroleum and water. Its alcoholic solution has a strong bitter taste, and an alkaline reaction, and is dextrorotary: $[\alpha]_D = +121.1°$ at $p. = 2$ and $t. = 15°$. It dissolves in concentrated sulphuric acid with reddish yellow color, which slowly darkens; in nitric acid with an intense yellow. It is soluble in concentrated hydrochloric acid, but it is decomposed when heated with it in sealed tubes at 150°. It yields two series of salts, normal and monacid. The *hydrochloride* $C_{19}H_{24}N_2O,HCl$, crystallizes in anhydrous colorless plates, readily soluble in alcohol, very sparingly soluble in water (according to Arnaud it contains 1 mol. H_2O). The *platinochloride* $(C_{19}H_{24}N_2O)_2,H_2PtCl_6$, is obtained as a yellow flocculent precipitate, apparently becoming crystalline after a time. The *hydrobromide*, $C_{19}H_{24}N_2O,HBr$, crystallizes in long flat needles, sparingly soluble in cold water. The *hydriodide*, $C_{19}H_{24}N_2O,HI$, forms long colorless flat needles. The *thiocyanate*, $C_{19}H_{24}N_2O,CNSH$, forms colorless plates or short prisms, and is very sparingly soluble in cold water. The *nitrate*, $C_{19}H_{24}N_2O,HNO_3$, forms short colorless prisms, melts at about 195°, is sparingly soluble in cold water, readily in boiling water and hot alcohol. The *normal sulphate* $(C_{19}H_{24}N_2O)_2H_2SO_4$, crystallizes in colorless prisms, is readily soluble in hot or cold water, very sparingly soluble in cold alcohol. Its aqueous solution is dextro-rotary:

$[\alpha]_D = +36.7^\circ$ at p. $= 2$ and t. $= 15$; $[\alpha]_D = +39.8^\circ$ at p. $= 6$; and $[\alpha]_D = +39.6^\circ$ at p. $= 2$ and 2 mol. H_2SO_4. The *acid sulphate*, $C_{19}H_{24}N_2O,H_2SO_4$, crystallizes in anhydrous prisms and shows the rotary power $[\alpha]_D = +34.9^\circ$ at p. $= 2.4$ and t. $= 15^\circ$ and $[\alpha]_D = +37.4^\circ$ at p. $= 6$. The *thiosulphate*, $C_{19}H_{24}N_2O,S_2O_3H_2$, forms anhydrous prisms sparingly soluble in water. *Acetylcinchonamine*, $C_{19}H_{23}AcN_2O$, prepared by heating cinchonamine with acetic anhydride for some hours at 85°, is amorphous, sinters together at 65°, and melts at 80 to 90°, is readily soluble in ether, alcohol, chloroform and acetic acid. *Dinitrocinchonamine*, $C_{19}H_{22}(NO_2)_2N_2O$, is best prepared by dissolving cinchonamine in nitric acid of sp. gr. 1.06, and pouring the intensely yellow solution into an excess of very dilute ammonia. It forms yellow flocks, melts at 118°, is readily soluble in ether, chloroform, alcohol and acetic acid. A solution in hydrochloric acid gives with platinic chloride a yellow flocculent precipitate of the *platinochloride* $[C_{19}H_{22}(NO_2)_2N_2O]_2,H_2PtCl_6 + 3H_2O$.

The author also describes the preparation and characters of *cinchonamine methiodide*, *methylcinchonamine*, *cinchonamine ethiodide*, *ethylcinchonamine*.

Concusconine, $C_{23}H_{26}N_2O_4 + H_2O$, is obtained in the free state by decomposition of the sulphate with dilute soda, and recrystallization from alcohol to which a little ammonia has been added. It forms colorless or pale yellow compact prisms. It is readily soluble in ether, chloroform, and benzene, sparingly soluble in boiling alcohol, insoluble in water. It is optically dextrorotary, giving for $C_{23}H_{26}N_2O_4 + H_2O$, p. $= 2$, t. $= 15^\circ$; in 97 vol. per cent. alcohol $[\alpha]_D = 40.8^\circ$. The hydrate melts at 144°, becomes anhydrous, and then melts again at 206 to 208° ; at 140 to 150° it becomes dark brown colored, being in small part converted into amorphous concusconine. (This amorphous concusconine is readily separated by conversion of the fused mass into the normal sulphates, treatment with alcohol, in which the sulphate of the amorphous base is readily soluble, and precipitation with ammonia, when it separates in dark brown, amorphous, readily-fusible flocks.) Concusconine dissolves readily in acetic anhydride, apparently without formation of an acetyl-derivative ; from this it seems that no hydroxyl-groups are present. Nitric acid converts it into a dark green mass ; addition of nitric acid to its solution in acetic or hydrochloric acids gives the dark green coloration characteristic of this group of alkaloids. Concentrated sulphuric acid dissolves concusconine with bluish green color, becoming olive-green on heating. With chromic acid and sulphuric acid it gives a coloration at first dark reddish brown, then intensely dark green. Although concusconine is tasteless, its solutions in acids have a bitter taste. The salts are, as a rule, gelatinous. The author describes the *platinochloride*, *normal sulphate*, *acid sulphate*, *hydriodide*, *hydrochloride*, *and hydroxide*.

Chairamine, $C_{22}H_{26}N_2O_4 + H_2O$, crystallizes in white needles or thick, colorless prisms, and melts at 140°, or, when anhydrous, at 233°. It is readily soluble in ether and chloroform; 1 part of the base dissolves in 540 parts of 97 per cent. alcohol. The alcoholic solution is strongly dextrorotary ($[a]_D$ = about 100°). Dissolved in sulphuric acid containing molybdic acid, the solution, at first colorless, becomes after a time an intense dark green. The *hydrochloride*, *platinochloride*, *normal sulphate*, and *thiocyanate* are described.

Conchairamine crystallizes with both water and alcohol of crystallization in thick colorless prisms of the formula, $C_{22}H_{26}N_2O_4 + H_2O + C_2H_6O$, the compound showing three melting points, namely, 82° to 86° for the whole compound, 108° to 110° after expulsion of the alcohol, and about 120° for the anhydrous compound, the mass resolidifying between each temperature. A small portion is converted by the heating into amorphous conchairamine. Conchairamine is readily soluble in hot alcohol, in ether, and chloroform, sparingly soluble in cold alcohol. Its solution in 97 per cent. alcohol has a rotary power $[a]_D = + 68.4°$ at $p. = 2$ and $t. = 15°$. The alcoholate dissolves in sulphuric acid containing molybdic acid, giving a brown coloration that soon becomes intensely dark green. With potassium chromate and sulphuric acid, it gives a coloration at first reddish-brown, then dark green, and reddish yellow if boiled with excess. The *hydrochloride*, *platino chloride*, *hydriodide*, *thiocyanate*, *sulphate*, *nitrate*, and *methiodide* are described.

Chairamidine, $C_{22}H_{26}N_2O_4 + H_2O$,. forms an amorphous white powder, melts at 126 to 128°, and is readily soluble in ether, alcohol, benzene, and chloroform, insoluble in water. Its alcoholic solution shows the rotary power $[a]_D = + 7.8°$ at $p. = 3$ and $t. = 15°$. It dissolves in concentrated sulphuric acid with yellowish color, which later turns dark green.

Conchairamidine, $C_{22}H_{26}N_2O_4 + H_2O$, crystallizes in white needles, melts at 114 to 115°, and is very readily soluble in ether, chloroform, alcohol, benzene, and acetone. Its solution in alcohol (97 per cent.) is lævorotary, $[a]_D = - 60°$ at $p. = 3$ (anhydrous) and $t. = 15°$. It dissolves in concentrated sulphuric acid with an intense dark green color. With chromic and sulphuric acid it gives a solution at first brown, then dark green.—Amer. Jour. Phar., April 1885, 200–205; Annal. d. Chem. (225), 211–262; Jour. Chem. Soc., Jan. 1885, 64.

Cinchonamine—Physiological Action.—Messrs. Sée and Bochefontaine have made some physiological experiments with the sulphate of cinchon amine. They found it to be about six times more toxic than quinine, cinchonidine or cinchonine. A guinea-pig into which 0.25 gram of the sulphate of cinchonamine had been injected, fell on its flanks three or four minutes afterwards, as if it had been struck by lightning, and with a slight movement of its feet died almost instantaneously. The physiological action seems to consist in a gradual enfeebling of the powers of the central nervous system, ill-defined convulsive movements in warm-blooded animals, a weakening and slackening of the heart-beats, and when large doses are given, rapid death by diastolic stoppage of the heart. Atropine does not reëstablish the heart movements after they have been affected by cinchonamine.—Compt. Rend. c., 366; Phar. Jour. and Trans., Feb. 28, 1885, 695.

In a further report on the physiological action of cinchonamine, the author points out that this alkaloid possesses the peculiar property of stimulating the salivary glands, and causing considerable increase in the flow of saliva, independently of any influence on the central nervous system; but no augmentation of any other secretion, such as the urine or pancreatic juice, was observed, except in one case, in which the flow of bile seemed to be increased.—Phar. Jour. and Trans., Mar. 28, 1885, 791; Compt. Rend. c., 645.

Homoquinine—Conversion into Quinine, etc.—Mr. O. Hesse communicates the results of his investigations relative to the occurrence of quinine and homoquinine in cuprea barks (derived from *Remijia pedunculata*). That quinine exists in this bark—and consequently in other barks than those of the genus *Cinchona*—he had shown conclusively in 1871, and he claims priority, Mr. J. E. Howard's claim to the contrary notwithstanding. His present investigations lead him to the conclusions that:

(1) Homoquinine is a modification of quinine.

(2) Cuprea bark, in many cases, contains this modification together with quinine.

(3) Several modifications of quinine exist, which by suitable treatment pass into ordinary quinine.

It is owing to the conversion of homoquinine into quinine that he had failed heretofore to isolate that alkaloid from cuprea barks, and he concludes that the failure of Messrs. Barret and Wood to obtain it is due to the same cause. This conversion is effected by repeated precipitations of homoquinine from its acid solutions by soda lye, shaking the precipitates with ether, and this solution with very dilute sulphuric acid. The conversion is essentially accelerated by heating the base with soda lye, a previous heating of the acid solution being thereby made unnecessary. Treatment with ammonia does not effect a conversion.

The figures obtained in a previous investigation had led the author to adopt for homoquinine the formula $C_{19}H_{22}N_2O_2$; but in the course of this investigation, the analysis has given weighty evidence in favor of the formula $C_{20}H_{24}N_2O_2$. From ether containing water homoquinine separates, if undisturbed, partly in concentrically grouped needles, partly in stout decided prisms, derived from the rhombic system, terminating at the ends in a dome, the crystals being sometimes isolated and sometimes a few concentrically aggregated together. In a disturbed crystallization, on the other hand, according to the degree of concentration of the solution, either a sandy powder or a crystallization consisting of delicate lamellæ is obtained. In all cases it contains water of crystallization, the quantity varying between 2 and 2½ molecules, a part of which is readily given off at 80° to 100° C., and the remainder first at 120° to 125° C.

Crystals of homoquinine exposed to the air gradually become dull through efflorescence; in the more compact crystals, however, the amount of water never falls below 10 per cent. They can be exposed directly to a temperature of 100° C. without any fear that they will fuse, like, for instance, crystallized quinine trihydrate. At that temperature the alkaloid loses only a portion of its water of crystallization; it first melts at 170° C., forming, upon cooling, a colorless amorphous mass.

Homoquinine dissolves in ether with somewhat more difficulty than quinine; its solution does not gelatinize upon evaporation of the ether, but crystallizes up to the last drops, if the ether be absolutely free from alcohol. In chloroform it dissolves readily, but with more difficulty in benzol, and very slightly in light petroleum spirit. Alcohol dissolves it freely, and leaves it, upon evaporation, in the amorphous form.

The alcoholic solution of homoquinine tastes intensely bitter, and has a strongly basic reaction; it neutralizes hydrochloric and sulphuric acids perfectly. Its solution in an excess of dilute sulphuric acid shows a blue fluorescence, which is dispelled by sodium chloride and other haloid salts. Hydrochloric acid also removes this appearance, and a solution of the base in hydrochloric acid shows no fluorescence. These solutions rotate the plane of polarized light to the left; they give, upon the addition of chlorine water or hypochlorite of lime and excess of ammonia, a dark green color, like quinine.

With acids homoquinine forms neutral and acid salts, which, so far as they have up to the present been examined, correspond in their behavior towards precipitants, such as sodium hydrate, and carbonate and ammonia, with the corresponding quinine salts; on the other hand, they differ from them in their form, and partially in their greater solubility.

Neutral Hydrochlorate of Homoquinine is obtained by neutralization of an alcoholic solution of the alkaloid with hydrochloric acid. Upon evaporation of this solution, an amorphous residue is left that dissolves readily in water. The aqueous solution leaves again, upon spontaneous evaporation, an amorphous residue.

Acid Hydrochlorate of Homoquinine is obtained upon adding some hydrochloric acid to a concentrated aqueous solution of the neutral hydrochlorate; the acid hydrochlorate separates at once in stout colorless prisms, which dissolve pretty freely in water, but less readily in hydrochloric acid.

Acid Chloroplatinate of Homoquinine.—Upon mixing an aqueous solution of the previous salt with platinum solution, a pale yellow flocculent precipitate results, which almost immediately is re-arranged in small orange-red prisms. The salt contains water of crystallization that is first given off at 120° C.

Hydrosulphocyanide of Homoquinine is obtained upon mixing a solution of the neutral hydrochlorate with potassium sulpho cyanide. It is amorphous, dissolves slightly in cold water, but more freely in hot water and in alcohol.

Neutral Sulphate of Homoquinine is obtained upon saturation of hot dilute sulphuric acid with the base. Upon cooling of the solution the sulphate crystallizes in short six-sided colorless prisms, which, being very brittle, are broken more or less in collection. The salt dissolves in about thirty parts of boiling water, very slightly in cold water, freely in boiling alcohol, and is nearly insoluble in chloroform and ether. The analysis of this salt leads to the formula $(C_{20}H_{24}N_2O_2)_2, SO_4H_2+6H_2O$. Its crystals effloresce superficially in air, and become consequently dull; the loss of water is, however, not worth notice. Even after a considerable time the water of crystallization amounts still to 12.50 per cent. On the other hand, quinine sulphate exposed to exactly the same conditions would at the end of a couple hours have fallen to a powder, and would then contain only 4.2 to 4.6 per cent. of water. If the two sulphates, dehydrated at 120° C., be exposed to moist air, the quinine sulphate rapidly takes up 4 per cent. of water, but the homoquinine almost three times as much, namely, 11 to 12 per cent.

Neutral Tartrate of Homoquinine is obtained by mixing a hot aqueous solution of the sulphate with solution of Rochelle salt. It forms delicate white concentrically grouped needles, which dissolve with some difficulty in hot water, and are very slightly soluble in cold. The composition of the salt is represented by the formula $(C_{20}H_{24}N_2O_2)_2, C_4H_6O_6+2H_2O$.

The tartrate dried at 120° C., takes up from moist air only 1 molecule of H_2O; it has then the same percentage composition as neutral tartrate of quinine.

The dissimilar composition of the two tartrates must not be overlooked in the estimation of quinine optically by the method of Oudemans, Jr., otherwise, up to about 4 per cent. of cinchonidine sulphate might be "found" in a quinine sulphate, obtained from cuprea bark in which not a trace was present. This mistake may, however, be easily avoided, by previously determining the amount of water in the tartrate.—Amer. Jour. Phar., Oct. 1884, 515–525; from Annal d. Chem., ccxxv., 95.

Messrs. B. H. Paul and A. J. Cownley have repeated some of Dr. Hesse's experiments upon homoquinine. The limited quantity of material operated upon prevented a more complete examination. They confirm the conversion of homoquinine into quinine, or a body similar to it, but find that this conversion by means of soda takes place at once, and that repeated treatment is not necessary. Moreover, the conversion is not into a single body, but the homoquinine is split into two alkaloids, the one quinine, or a base closely resembling it, the other an alkaloid not hitherto observed, to which they provisionally give the name *cupreine*. These results, furthermore, show that, contrary to the opinion advanced by Dr. Hesse, homoquinine is not a modification of quinine.—Amer. Jour. Phar., Nov. 1884, 575–578; from Phar. Jour. and Trans., Sept. 20, 1884.

Homoquinine and Cupreine—Further Researches.—The researches of O. Hesse and of B. H. Paul and A. J. Cownley have been supplemented by others made by the same authors.

O. Hesse (Annalen, vol. 206, p. 240), corroborates the observation of Paul and Cownley that homoquinine on being treated with caustic soda is split into quinine and cupreine, yielding approximately 52 per cent. of the former and 48 per cent. of the latter alkaloid. Cupreine crystallizes from ether in colorless concentrically grouped small prisms, melts at 191° C, dissolves in dilute sulphuric acid without fluorescence, and this solution gives with chlorine and excess of ammonia the green color like quinine, but less intense. The neutral sulphate crystallizes in delicate prisms sparingly soluble in cold water, and the chlorhydrate forms small needles. The alkaloid combines also with bases, the sodium compound crystallizing in colorless satiny scales. Homoquinine is a compound of the latter class, and is obtained by crystallizing from ether a mixture in proper proportion of quinine and cupreine. The composition of the new alkaloid is being investigated by the author.

Paul and Cownley ("Phar. Jour. and Trans.," November 22, 1884, p. 401), obtained from homoquinine 62.37 per cent. of cupreine and 37.63 of quinine, and succeeded likewise in preparing homoquinine synthetically by crystallizing the mixed alkaloids from ether, quinine, if used in excess, remaining in solution. A number of salts prepared by the authors, show that cupreine as well as homoquinine must be regarded as distinct alkaloids, and that the characters of the tartrate of the latter may to some extent account for the fact that De Vrij and others came to the conclusion that cuprea bark contains cinchonidine.

Cupreine.	Homoquinine.
Sulphate. Solutions readily super-saturated; at the surface the salt separates as minute white specks, which under the magnifying glass show radiating needles.	Much more soluble than the cupreine salt; separates in slender needles, sometimes grouped in stellate bunches, and presenting characters closely analogous to those of quinine sulphate.
Acid phosphate. Much less soluble than the homoquinine salt; the concentrated solution yields distinct tufts of radiating acicular crystals.	By spontaneous evaporation the solution becomes syrupy and then solidifies as a gelatinous slightly fluorescent residue of very small bulk comparatively.

Hydrochlorate. Much less soluble than the homoquinine salt; distinctly crystallizable in bunches of long glassy needles.	Solution in drying up leaves an amorphous resinoid residue.
Nitrate. Very soluble; distinctly crystallizable in tufts of long, stout, radiating needles.	Solution dries up to a resinous residue, showing no sign of crystallization.
Oxalate. Apparently uncrystallizable, the solution drying up to a resinoid residue, with a few crystalline spots.	Much less soluble than the cupreine salt; delicate needles forming at the surface, and becoming opaque on drying.
Tartrate. Much more soluble than the homoquinine salt.	Very sparingly soluble, in many respects resembling cinchonidine tartrate.
Hydriodate. Sparingly soluble in water; distinctly crystallizable without any sign of a resinoid deposit.	Faintly yellow resinoid mass, very similar to that furnished by quinine salts with potassium iodide.
Acid solutions. No fluorescence.	Very marked fluorescence.
Caustic soda, 10 per cent. solution } Very soluble in the cold, and without decomposition.	Decomposed into quinine and cupreine.
Strong alcohol. Less soluble than homoquinine; crystallizes very readily in dense warty groups of minute crystals.	Very soluble; solution dries up almost to to an amorphous residue before showing any signs of crystals in minute bunches.
From ether. Crystals more massive than the last, arranged in groups and conspicuously striated transversely.	Very thin prismatic laminæ, having characteristically shaped ends with two oblique planes.

—Amer. Jour. Pharm., May 1885, 249–250.

Homoquinine—Synthesis.—By decomposing homoquinine with caustic soda and determining the amount of quinine thus produced, B. H. Paul and A. J. Cownley obtained 41.4 per cent. of quinine and 58.6 cupreine. By mixing the ether solutions of cupreine and excess of quinine, and after crystallizing determining the surplus quinine, the same authors obtained in two experiments the following figures as representing the composition of homoquinine: quinine, 37.20 and 39.08 per cent.; cupreine, 62.80 and 60.92 per cent. From these results the proportion of quinine and cupreine in homoquinine seems to be as 2 : 3.—Amer. Jour. Phar., June 1885, 308; Phar. Jour. and Trans., March 7, 1885, p. 729.

Dicinchonine—Characters.—*Dicinchonine*, $C_{38}H_{44}N_4O_2$, according to O. Hesse, exists in the bark of *Cinchona rosulenta* and *C. succirubra*, chiefly in the branch bark of red cinchona. It may be obtained by fractional precipitation with sulphocyanide from the mixed amorphous alkaloids before melting, but not from commercial chinoidine, the dark-colored compounds preventing crystallization. The bark of *C. rosulenta* is the best material, containing besides cinchonidine, homocinchonidine, cinchonine, and traces of quinamine and conquinamine, about 0.2 to 0.3 per cent. of dicinchonine. The neutral sulphate solution is treated with Rochelle salt for separating the first two alkaloids, then with excess of ammonia, and shaken with small quantities of ether, whereby most of the cinchonine is left behind; the ether solution is agitated with dilute acetic acid, and this liquid neutralized and precipitated in fractions by potassium sulphocyanide, the first and third fractions being mixed with the other bases. The dicinchonine sulphocyanide is treated with caustic soda solution, the mixture extracted with ether, the ether solution washed with water and evaporated, the residue dissolved in alcohol, neutralized with hydrochloric acid and evaporated. when dicinchonine hydrochlorate crystallizes. The free base is easily soluble in ether, acetone, alcohol, chloroform and in benzol, less freely soluble in water and petroleum benzin, insoluble in caustic soda; the alcohol solution has an alkaline reaction and a bitter taste, and is dextrorotatory; chlorine and ammonia do not produce a green color. The *hydrochlorate* crystallizes in anhydrous four-sided prisms, which are often nearly cubical, and readily dissolve in water and alcohol. The *chloroplatinate* forms orange-yellow flocks, readily soluble in hydrochloric acid. The *hydriodate* is in stout crystals, soluble in water, but insoluble in concentrated solution of sodium chloride or potassium iodide. The *sulphocyanide* is amorphous, and separates from hot water as an oily layer. The *oxalate* is obtained in firm crystals on gradually adding an ether solution of oxalic acid to an ether solution of the base; the salt is freely soluble in cold water. On heating the alkaloid for 6 hours with concentrated hydrochloric acid to between 140° and 160° C., it is completely converted into *diapocinchonine;* and the same base is probably contained in the dark-colored mass formed by heating dicinchonine with sulphuric acid to 130° C.—Ann. d. Chem., vol. 227, pp. 153–161; Am. Jour. Phar., July, 1885, 352.

Purified Chinoidin—New Process.—Dr. J. E. De Vrij, in view of the fact that his method by means of benzol has the disadvantage that the odor of benzol persistently adheres to the product, now proposes the following process, which furnishes a pure and unobjectionable product: One hundred parts of chinoidine are boiled during five or ten minutes with a dilute solution of soda under constant stirring, the object of this treatment being to remove, at least in part, a compound of amorphous alkaloid and kinic acid, and also an unknown substance. When cold, the brownish alkaline liquid is poured off, and the remaining chinoidine washed with a little water. 300 parts of water are now added to the washed chinoidine, the whole heated to boiling, and then mixed very slowly with the least necessary quantity of nitric acid to obtain a homogeneous, dark-colored solution. The addition of a quantity of nitric acid *only just sufficient*, is the principal point of the whole treatment. Until the proper experience has been acquired in this, it is advisable rather to leave a few grammes of chinoidine undissolved than to use *one* drop of acid too much. As soon, then, as the homogeneous, strongly alkaline solution has been obtained, it is poured into a tall glass in which it is allowed to stand during one night. The liquid will separate into two portions, of which the upper remains thin liquid, and has a light reddish-yellow color, while the lower main portion is more viscid, and has a dark brownish-red color. The upper layer is poured off as clear as possible into a tall beaker, and water added to the remaining lower layer, with thorough stirring. After a few minutes' rest, the upper layer is then poured off again and added to the former. This operation is repeated until the lower layer ceases to yield anything to water, and is converted into a brownish-black mass insoluble in water, which is thrown away.

The united liquids thus poured off are turbid. A small quantity of it is now filtered, in order to ascertain whether the clear filtrate will become turbid when mixed with water. If this is the case, still more water must be added to the united liquids, until they are no longer rendered turbid by it. After allowing the mixture to stand one night, it is filtered, and the filtrate mixed in a porcelain capsule, with an excess of soda, which causes the separation of the purified chinoidine. When the alkaline liquid has become clear by settling, it is poured off, and the chinoidine washed with water until the washings cease to affect turmeric paper. The capsule is then warmed for some time on the water-bath, with occasional agitation of the contents.

At first the melted chinoidine is a thin liquid, but when it loses its water it becomes thicker, and towards the end becomes like thick honey. When this is the case, and it has been shown that a small sample, when removed and cooled, becomes hard and brittle, the warm mass is removed from the capsule as much as possible, while the residue may be readily removed when cold.

During the heating on the water-bath an aromatic odor is perceptible. The loss incurred during this process amounted, in the case of Zimmer's chinoidine (the best in the market), to 14 per cent.

Chinoidine thus purified has a dark yellowish-red color, is transparent in thin layers, hard and brittle. It is easily reduced to a light-yellowish-gray powder, and in this form it merits the attention of physicians. When warmed with water or dilute solution of soda, upon the water-bath, these liquids acquire at most a faint light yellowish tint. It is easily soluble in acids, and it is possible to prepare solutions of an alkaline reaction which, when highly concentrated should not be rendered turbid by adding much water. Ether dissolves 80 per cent. of it.

Chinoidine contains *at least* two amorphous alkaloids, of which that which constitutes the main portion is dextrogyrate, and soluble in ether. The other alkaloid is lævogyrate, and less soluble in ether. Hence a considerable quantity of ether is necessary to dissolve the soluble alkaloid. The combinations with acids all color red litmus blue, and are strongly hygroscopic, with the exception of the borate. When these compounds are well dried they retain their pulverulent form, even when heated on a water-bath. The hydrochlorate of purified chinoidine, which has been put on the market for some years past by Zimmer, under the name "Chininum amorphum muriaticum purum," has been much used in medical practice.—Amer. Drug., July 1884, 134, from Nieuw. Tijdschr. f. d. Pharm., 1884, 132.

Strychnine—Constitution.—Schützenberger has maintained that strychnine is not a uniform body, but a mixture of three alkaloids, which latter were said to be distinguishable by their varying percentage of carbon, different solubility, and crystalline shape. Dr. Hager now states that Schützenberger's view appears to be correct. He concludes this from the fact that, if a few drops of a solution of nitrate of strychnine in warm water be allowed to evaporate upon a microscope slide in a lukewarm place, the field will be seen, under a lens magnifying one hundred diameters, to contain three or four different forms of crystals, octahedrons, combinations of octahedrons with cubes, also columnar and triangular prisms. He promises to publish illustrations of these in his Commentary to the German Pharmacopœia.—Amer. Drug., July 1884, 129; from Phar. Centralh.

The editor of the "American Druggist" does not agree with Dr. Hager in considering these different crystalline shapes to be a positive proof of the multiple composition of strychnine in general. At most, the particular sample might be supposed to contain different bodies. Until the supposed alkaloids are separated and their difference is absolutely demonstrated otherwise, we shall have to adhere to the opinion that strychnine is a homogeneous and well characterized alkaloid of constant composition.—Ibid.

Strychnine—Study of its Bromo- and Chloro-Compounds.—Mr. W. A. Shenstone communicates a paper in which he gives an account of his investigation of the halogen compounds of strychnine, which have been already incompletely investigated by Herapath, Tilden, and Laurent. In his present paper the author considers principally *bromo* and *dibromo-strychnine*, *chloro-strychnine* and the action of nitric acid on the first-named.—See Amer. Jour. Phar., May 1885, 252–256; from Jour. Chem. Soc., March 1885, 193.

Brucine and Strychnine—Microscopic Determination.—Dr. O. Lindt proposes the following test: For brucine a convenient test is selenic acid containing nitric acid (5 drops selenic acid of sp. gr. 1.4 and 1 to 2 drops nitric acid of sp. gr. 1.2). If the fatty oil is first removed from sections of nux vomica or ignatia beans by petroleum ether, and this reagent used, the laminated cell-walls quickly take a bright red color which gradually turns to orange and yellow, while the cell-cavity and the granular substance contained in it remain uncolored, indicating the absence of brucine. Nitric acid alone does not answer, the coloration of the alkaloid being marked by the formation of xanthroproteic acid.

The position of strychnine in the sections is best shown by a solution of ceroxide sulphate in sulphuric acid, if the fatty oil, grape sugar and brucine have first been removed by maceration in petroleum ether and absolute alcohol. If added immediately before the observation is made, the reagent imparts a violet-blue color to all the thickening layers of the cell-walls. But the color rapidly disappears, while the deposits of albumen assume a bluish opalescent tint which finally turns to a reddish-violet. The interior of the cell takes an intense red color. The reagent retains its activity for a considerable time.—Phar. Jour. and Trans., Aug. 9, 1884, 107; Zeitschr. für. Wissensch. Mikroskopie.

Aconite Alkaloids—Constitution.—Mr. Mandelin has contributed a lengthy paper on the constitution and character of the aconite alkaloids, and has arrived at conclusions which, if accepted as final, will overthrow most of the conclusions at which previous investigators had arrived. By reference to previous "Proceedings" it will be recalled that Dr. Wright obtained two powerfully toxic alkaloids, "aconitine" and "pseudaconitine," from the tubers of both *Aconitum Napellus* and *A. ferox*, but not in the same proportions, aconitine largely preponderating in the yield from the former, and pseudaconitine in that from the latter. These are described as readily breaking up under the influence of strong reagents, aconitine into benzoic acid and a relatively inert base which has been named "aconine," and pseudaconitine into veratric acid and a corresponding but different base, "pseudaconine." Mr. Mandelin accepts the existence of the two characteristic alkaloids, but asserts that only aconitine and no pseudaconitine occurs in the tubers of *A. Napellus*, and only pseudaconitine and no aconitine in those of *A. ferox*. These alkaloids, he says, are pharmacologically identical, but pseudaconitine having the larger molecule, requires to be administered in larger quantity to produce an equal effect. He confirms the splitting up of these alkaloids, but fails to recognize any difference between the resulting aconine and pseudaconine, and he, therefore, proposes that in future aconitine shall be known as "*benzoyl-aconine*" and pseudaconitine as "*veratroyl-aconine*." There is, however, no indication that this opinion as to the identity of the aconines is based upon analysis, whilst Dr. Wright represented them as differing in composition. Japaconitine, the alkaloid first isolated from Japanese aconite root by Messrs. Paul and Kingzett, and afterwards described by Messrs. Wright and Luff as splitting up into benzoic acid and "japaconine," the author maintains that it is identical with aconitine or benzoyl-aconine. As in the previous cases, his opinion is not supported by analytical data, and is mainly based upon pharmacological results, which were moreover obtained with a specimen supplied as Japaconitine from a well-known German house, but of the genuineness he had no further guarantee. Applying his observations practically, Mr. Mandelin expresses an opinion that the supposed characteristic alkaloids of the three species of *Aconitum* mentioned, are reducible to benzoyl-aconine and veratroyl-aconine, both yielding the decomposition product aconine; also that French and German commercial "aconitine" is more or less pure benzoyl-aconine and English more or less pure veratroyl-aconine, the varying activity being due to the larger or smaller proportion of the decomposition products in the respective preparations. Huebschmann's "napelline," also, he considers to be unaltered aconitine with varying proportions of aconine. The greater or less activity and toxicity of the tubers of *A. Napellus*, *A. ferox* and *A. Japonicum*, he holds to be dependent upon their richness in alkaloid, and not upon any difference between the toxic power of the alkaloids contained in them.—Phar. Jour. and Trans., Mar. 28, 1885, 789; Arch. d. Phar., Feb. and Mar. 1885, 79, 129 and 161.

Aconite Alkaloids—Action on the Heart.—Dr. A. Torsellini has recently made a series of experiments on the heart of the frog and the toad, with the following results:

1. *Nitrate of aconitine* causes, in the exsected heart a slight, in the removed heart strong diminution of the cardiac beat; and in the latter also a very slight and transitory lessening of the systolic elevation. In neither is the rhythm irregular.

2. *Nitrate of napelline* causes irregularity of the rhythm in each, lessens the systolic elevation, and causes no slowing of the heart-beats in the exsected heart, but an increased contraction of the unremoved heart.

3. *Nitrate of lycoctonine* slightly increases the beats of the exsected heart, increases the systolic elevation in both, and does not change the regularity of the heart's action in the least; on the contrary, it antagonizes the irregularity caused by napelline.

4. *Aconitic acid* acts on the heart in a decidedly paralyzing manner.

From these results it is seen that the different alkaloids of aconite not only act differently, but that some antagonize others, as regards the effects on the heart.—Amer. Jour. Phar., Mar. 1885, 152; from Centralbl. für die gesammte Therap., October, 1884; Medical News.

Aconitine—Action on Salts of Silver.—According to H. Hager, aconitine may be recognized by its reducing action on salts of silver. On dissolving 0.02 or 0.03 gm. aconitine in 3 to 4 cc. alcohol, and adding a few drops of solution of nitrate of silver, instantaneous reduction takes place, which action may be accelerated by heat. The drops falling into the aconitine solution cause turbidity and a brownish color. More than traces of other salts, especially alkalies, prevent the reduction until after repeated boiling. The scaly aconitine of commerce seems to have been obtained by spreading an alcoholic solution on glass plates.—Pharm. Centralhalle, 1885, p. 6; Am. Jour. Phar., April 1885, 172.

Myoctonine—Physiological Action.—Mr. Salmonowitz communicates the results of his experiments on the physiological properties of myoctonine. He describes it as a yellowish, bitter-tasting amorphous powder, having a composition represented by the formula $C_{27}H_{30}N_2O_8$, and a melting point between 143.5° and 144° C. In water it dissolves with difficulty, in acidulated water more freely, and it is soluble in all proportions in bisulphide of carbon, absolute alcohol, chloroform, and benzene. Ether and light petroleum spirits only dissolve traces of it. Experimenting with myoctonine obtained by Messrs. Dragendorff and Spon from the yellow-flowered *Aconitum lycoctonum*, the alkaloid proved to be a powerful poison, rerembling curare in its action, and acting most energetically when introduced directly into the circulation. The subcutaneous injection of 0.075 gram of nitrate into a cat produced distinct toxic action, and the injection of 0.1 gram was always followed by death in twenty to thirty minutes. Mice were killed by one milligram in three minutes.—Phar. Jour. and Trans., May 2, 1885, 892; from the author's Dissertation, Dorpat.

Atropine.—Process for its determination in the root and leaf. See *Belladonna* under "Materia Medica."

Atropine—Preservation of Solutions.—A number of years ago Mr. George Abbott, with a view to ascertaining the best means of preventing change in atropine solutions, had a series of samples made up, to each of which was added a different antiseptic substance. After some time it was found that the preparation containing camphor and thymol was still clear, whilst fungoid growths had commenced in all others, and he has since then directed the solution of this substance in camphor water. Having preserved the original solutions he has recently (after six years) again examined them. He found that the solution containing thymol (½ gr. to 1 oz.) had remained clear, but that it had lost its mydriatic effect completely; whilst the solution containing camphor (2 grs. to 1 oz.), though a little turbid, dilated the pupil as freely as when freshly prepared.—Phar. Jour. and Trans., Feb. 28, 1885, 693; Lancet, Feb. 14, 1885, 315.

Neutral Salicylate of Atropine—Preparation.—Salicylate of atropine is considered to be the most effective and quickly acting of all atropine salts, provided it is pure and perfectly neutral. It may be prepared in the following manner: Twenty-three parts of atropine are dissolved at a very gentle heat in pure alcohol, and enough salicylic acid (about 18 parts) gradually added until the solution is neutral, which is to be ascertained by repeated testing with litmus paper. The solution is now evaporated, on the water-bath, to a jelly, in which form it has an amber color.

Finally it is completely dried in a drying oven. The resulting amorphous salt must be kept in securely stopped vials, since it is very deliquescent. If carefully kept, it keeps well ; in solution, however, it is not very stable, since a copious formation of fungi occurs, usually in a few days. For this reason its solution should be prepared freshly when wanted.—Amer. Drug., Dec. 1884, 224; from Phar. Post.

Salicylate of Atropine—Superiority over the Sulphate.—It is stated in "Lancet" (Sept. 27, 1884,) that salicylate of atropine appears to be in some quarters displacing the sulphate. Frederici has prepared the neutral salt by dissolving the atropine (twenty-three parts) with the aid of gentle heat in a suitable quantity of pure alcohol, and then adding the salicylic acid gradually to complete neutralization (eighteen parts) the solution being carefully tested with litmus paper during the operation. The liquid is then evaporated in a water-bath to a gelatinous consistence, the mass assuming an amber color, and the drying is finished in a sand-bath or drying-closet. The compound deliquesces quickly when exposed to the atmosphere, but is said to keep well if properly preserved, though the solution is very unstable.—Amer. Jour. Phar., Dec. 1884, 646; from Med. and Surg. Reporter.

Atropine, Hyoscyamine, and Homatropine—Reaction with Mercuric Chloride.—The observation of Mr. A. W. Gerrard (see Proceedings, 1884, 318), that the tropine alkaloids produce in an alkaline liquid a red precipitate upon the addition of a 5 per cent. alcoholic solution of mercuric chloride, has led Mr. Schessinger to repeat the experiments. His results confirm Mr. Gerrard's observations in so far as atropine is concerned ; but he found that with hyoscyamine a red precipitate was not produced when 2 cc. of the reagent was used to a milligram of the alkaloid, though he obtained it by using only two drops to the same quantity and gently warming. He suggests that this difference of behavior might be utilized to distinguish between atropine and hyoscyamine, for which purpose a 1 per cent. solution is preferable. With homatropine he failed altogether to obtain the reaction, only a yellow precipitate being found, which disappeared upon further addition of the mercuric solution, and warming.—Pharm. Ztg., Oct. 1884, 1 ; Phar. Jour. and Trans., Nov. 1, 1884, 342.

Belladonnine—Purification and Composition.—On boiling commercial belladonine with baryta solution, the atropine contained therein is decomposed, and belladonine remains behind as a brown resin, which, according to G. Merling, cannot be crystallized. Its composition is $C_{17}H_{21}NO_2$. Dissolved in diluted alcohol and boiled with baryta, it yields tropine and several acids, probably tropic, atropic, and isatropic acids.

The liquid obtained above, after removing the baryta with carbonic acid, yields to ether several bases, among them the one named oxytropine by Ladenburg, which the author believes exists ready formed in commercial belladonnine.—Amer. Jour. Phar., Feb. 1885, 108; from Ber. d. Deutsch. Ch. Ges., 1884, 381–385.

Belladonnine—Action of Boiling Alkalies.—Messrs. A. Ladenburg and C. F. Roth have ascertained that when this alkaloid or mixture of alkaloids is boiled with alkalies, it is decomposed into tropine and an *oxytropine*, which gives a platinochloride, $(C_8H_{15}NO_2)_2,H_2PtCl_6$, crystallizing in large red quadratic prisms, readily soluble in water; the acids formed at the same time are tropic acid and its decomposition products, atropic and isatropic acids. It is therefore possible that "belladonnine" is a mixture of atropine and oxytropine, $C_{17}H_{23}NO_4$; further investigations are in progress.—Amer. Jour. Phar., Nov. 1884, 597–598; Ber. d. D. Chem. Ges., [17], 152–153.

Hyoscine—Action of Boiling Alkalies.—Ladenburg has shown that on boiling hyoscine with alkalies or baryta, it is resolved into tropic acid and pseudotropine, a base isomeric with tropine. Both products have been further examined by A. Ladenburg and C. F. Roth.

Pseudotropine crystallizes in rhombohedrons, melts at 106°, and boils at 241°–243° (tropine crystallizes in the rhombic system, and melts at 62°); it is less hygroscopic than tropine, is very readily soluble in water, readily soluble in chloroform, and sparingly in ether. Proof of the identity of the tropic acid from hyoscine with that from other sources was obtained by its conversion into atropine when treated with tropine and hydrochloric acid.—Amer. Jour. Phar., Nov. 1884, 584; from Ber. d. D. Chem. Ges., [17] 151–152.

Daturine—Identity with Atropine.—Mr. E. Schmidt, having received several inquiries from physicians and others as to what substance was to be understood under the term "daturine," and in what it differed from atropine, answers the question in this paper upon the basis of the investigations carried on by himself and by Ladenburg. He points out that in these investigations it was ascertained by different methods that the two alkaloids, atropine and hyoscyamine, are contained in *Atropa Belladonna* as well as in *Datura Stramonium*. The experiments of the author showed that in both plants the principal part of this alkaloidal mixture consists of atropine, having a melting point of 115° to 115.5°C., the quantity of hyoscyamine remaining in the mother liquor after the crystallization of the atropine being considerably smaller. According to the author's experience, the yield of "daturine," which name is used to describe the basic mixture isolated from *Datura Stramonium*, varies very considerably according to the quality of the seed. For instance, four samples of thorn-apple seed from different sources yielded from 5 kilos respectively 12.5, 18.4, 2.6 and 10.2 grams of yellowish white crude "daturine." From 50 to 70 per cent. of this crude daturine consisted of pure atropine melting at 115° to 115.5° C. Moreover, a preparation of crude "daturine" received from Trommsdorff, of Erfurt, from which a first crystallization had been removed, yielded still nearly 45 per cent. of pure atropine. Similar relations were also observed in the crude "atropine" from belladonna root. Ten grams of crude "atropine" prepared by the author yielded, in repeated spontaneous evaporation of its solution in alcohol, between five and six grams of shining acicular crystals of atropine, melting at 115° to 115.5° C. Similarly ten grams of crude "atropine," supplied by Trommsdorff, contained rather over six grams of pure atropine. It appeared probable that the mother-liquors still contained considerable quantities of atropine, probably hindered from crystallizing by admixture of other bases, and in this respect no essential difference was observed between the mother-liquors of crude "atropine" and those of crude "daturine."

In the crude mixtures from belladonna root and thorn-apple seed, examined by the author, and mostly prepared by him, the larger proportion of each sample consisted, as mentioned above, of atropine. The remaining and smaller portion, which was much more difficult to crystallize, consisted of hyoscamine and probably other bases and their decomposition products.

Inasmuch as neither the investigations of Ladenburg, nor those of the author, connect the name "daturine" with a particular chemical individuality, the author thinks it desirable, in order to avoid doubt and error, that this name should be dropped from chemical literature and price-currents, and that the alkaloids should be described by the names agreeing with their chemical characters. Consequently, leaving out of the question hyoscine, which Ladenburg found in the henbane together with hyoscyamine, Herr Schmidt would provisionally characterize only two plant bases having a mydriatic action: atropine, melting at 115° to 115.5° C., and hyoscyamine, melting at 108.5° C. Duboisine is, according to Ladenburg, in the pure condition, identical with hyoscyamine, and the belladonnine of Hübschmann and of Kraut is probably a mixture of atropine with oxyatropine (Ladenburg and Roth). Should it be desired to differentiate between chemically identical atropine according to its origin, it would be simply to make a distinction between an atropine from *Atropa Belladonna* and one from *Datura Stramonium*, but not between atropine and daturine.—Phar. Jour. and Trans., July 12, 1884, p. 29; Arch. d. Phar., xxii., 329; Amer. Jour. Phar., Aug. 1884, 440–442.

Crystallized Colchicine—Preparation and Characters.—Mr. A. Houdés has prepared and describes crystallized colchicine. Three kilos of colchicum seeds were exhausted with 100 kilos. of alcohol of 96°, the liquid filtered, the alcohol distilled off, and the residue treated repeatedly with a five per cent. solution of tartaric acid, which dissolves out the colchicine, but leaves fatty and resinous matters undissolved. The filtered solution was then agitated with chloroform, the chloroform removed by evaporation, and the crude product purified by repeated crystallization from a mixture of equal parts of chloroform, alcohol, and benzene. The yield from the seeds is about 3 grams per kilo., whilst that from the bulbs is only 0.4 gram per kilo.

The colchicine thus obtained forms nodular groups of colorless prisms, slightly soluble in water, glycerol, and ether, but soluble in all proportions in alcohol, benzene, and chloroform. It has a very bitter taste and an alkaline reaction, contains nitrogen, and burns without residue. It is hydrated, and melts at 93°, but after drying at 100°, the melting point rises to 163°. A solution of colchicine does not reduce an alkaline copper solution, but after prolonged boiling with dilute sulphuric acid, it reduces it immediately, and in this respect resembles solanine. Colchicine combines with certain organic acids, but is decomposed when brought in contact with strong acids.

Concentrated or dilute inorganic acids dissolve colchicine and form a citron-yellow solution; nitric acid produces a transient violet coloration. Solutions of colchicine are precipitated by potash and soda, but not by ammonia. Tannin produces a white precipitate soluble on heating; platinum tetrachloride, an orange-yellow precipitate; an aqueous solution of iodine, a kermes-red precipitate; mercuric potassium iodide, a yellow precipitate; iodine in potassium iodide, a maroon-yellow precipitate.

Colchicine exerts a physiological effect only in relatively large doses. Respiration and the functions of the heart are considerably modified, and the general effect is a state of collapse, with stupor, but without insensibility.—Compt. Rend., xcviii., pp. 1442–1444; Jour. Chem. Soc., pp. 1055–1056, October 1884; Amer. Jour. Pharm., Jan. 1885, 35.

Pilocarpine—Action of Bromine.—Chastaing finds that when bromine is added to a solution of pilocarpine in chloroform, there is development of heat, the mixture becomes acid, and a heavy oily liquid separates. The supernatant chloroform retains the excess of bromine, together with a small quantity of the bromo-derivative, which gradually crystallizes out. The oily liquid is rapidly evaporated, and forms a deep golden-yellow resinous mass, which is then dissolved in chloroform, from which it separates in a mass of minute prismatic crystals. These crystals have the composition $C_{11}H_{15}N_2O_2Br_5$, and consist of a *dibromide of dibromopilocarpine hydrobromide*, $C_{11}H_{14}Br_2N_2O_2HBr,Br_2$. This substance is inodorous, but when exposed to air it absorbs moisture and gives off ethyl bromide, undergoing some alteration which results in the formation of a compound containing less carbon than the original substance. In contact with copper, dibromide of dibromopilocarpine hydrobromide gives up part of its bromine; and, when treated with silver oxide in presence of water and chloroform, it loses Br_3, and yields dibromopilocarpine, $C_{11}H_{14}Br_2N_2O_2$, which resembles pilocarpine in appearance, but is less mobile and less strongly alkaline; it is precipitated by platinum chloride.

The action of bromine on pilocarpine in presence of a small quantity of water does not yield dibromide of dibromopilocarpine hydrobromide, but the corresponding derivative of a feebler base, which contains an atom of carbon less than pilocarpine. This carbon is given off as carbonic anhydride, and the compound formed should be represented by the formula $C_{10}H_{14}N_2O_2,HBr,Br_2$.—Amer. Jour. Phar., Sept. 1884, 478; from Compt. Rend. (97), 1435–1437.

Sulphates of Berberine—Existence of Two Compounds.—Prof. J. U. Lloyd announces that there are two sulphates of berberine, and they bear a resemblance to the two sulphates of quinine, excepting that in solubilities they are the reverse of the quinine salts. Thus:

$(C_{20}H_{24}N_2O_2)_2H_2SO_4.7H_2O$.—Sulphate of quinine *less* soluble than the bisulphate $C_{20}H_{24}N_2O_2H_2SO_4.7H_2O$.

$(C_{20}H_{17}NO_4)_2H_2SO_4$.—Sulphate of berberine *more* soluble than the bisulphate $C_{20}H_{17}NO_4H_2SO_4$.

The existence of these two sulphates was announced in "New Remedies," 1877, p. 226, in a paper by Mr. H. B. Parsons and Mr. T. J. Wrampelmeier, but they simply made the analysis without giving a description of the salts. Since that day, nothing has been printed to support or disprove their work, and we take pleasure, therefore, in saying that beyond a doubt the two sulphates exist. His own investigations show that such is the case, as well as the analysis of Prof. Virgil Coblentz, who, unaware of the work of Messrs. Parsons and Wrampelmeier, made several determinations of each salt as made by us. His report agrees exactly with that of the other gentlemen.

To sum up:

The original sulphate of berberine, $C_{20}H_{17}NO_4H_2SO_4$, that of the market, is a *bisulphate* and only moderately soluble.

The new sulphate of berberine $(C_{20}H_{17}NO_4)_2H_2SO_4$ is very soluble.—Amer. Drug., Sept. 1884, 166.

Cocaine and Its Hydrochlorate.—In view of the importance which this alkaloid has assumed by virtue of its remarkable power as a local anæsthetic, the following resumé of what has hitherto been known respecting the alkaloid, taken from an editorial in the December number of the "American Druggist," may properly find place here:

Cocaine, the alkaloid of *Erythroxylon Coca*, Lam., was discovered by Niemann in 1860, and afterwards studied by W. Lossen (1862), who assigned to it the formula $C_{17}H_{21}NO_4$.

Niemann prepared cocaine by exhausting coca leaves with 85 per cent. alcohol, containing $\frac{1}{50}$ of sulphuric acid, supersaturating the alcoholic solution with lime, then neutralizing carefully with diluted sulphuric acid, separating the precipitated sulphate of calcium, and distilling off the alcohol. The residuary liquid is supersaturated with soda and then shaken repeatedly with ether, which dissolves out the cocaine. On evaporating the ethereal solution, cocaine remains behind in an amorphous condition, but soon becomes crystalline. It is somewhat purified by washing with a little strong alcohol [?], and then recrystallized from highly dilute alcohol.

Lossen extracts coca leaves with rain-water, precipitates with acetate of lead, removes the excess of the latter remaining in solution by means of sodium sulphate, filters, and adds soda to the filtrate in slight excess. On shaking this mixture with ether, only *cocaine* passes into solution, while *hygrin* remains in the alkaline liquid. The crude cocaine obtained after the evaporation of the ether is dissolved in very dilute hydrochloric acid, and this solution dialyzed, the cocaine passing through parchment paper, while most of the accompanying coloring matter remains behind. From the dialyzed acid solution the alkaloid is then precipitated with soda, and obtained pure by several times recrystallizing it from alcohol.

Lossen obtained, in the most favorable case, 4 parts per 1,000, and from poor material only 1.6 parts per 1,000.

Cocaine crystallizes in four or six-sided monoclinic prisms. It is soluble at 12° C. in 704 parts of water, easily soluble in alcohol, and still more so in ether. It melts near 92°.

From a dilute aqueous solution of hydrochlorate of cocaine the alkaloid is precipitated by caustic alkalies and their carbonates, also by ammonia and ammonium carbonate, though the latter cause a considerable portion to be retained in solution. Bicarbonate of sodium and potassium yield a precipitate only in the concentrated solution. Sulphocyanide of potassium renders its solution but slightly turbid. So also tannic acid, provided free hydrochloric acid is present. Stannous chloride causes a white precipitate soluble in much nitric acid; mercuric chloride, a copious precipitate rapidly becoming flocculent, soluble in alcohol and hydrochloric acid; picric acid, a pulverulent, yellow precipitate, soon becoming resinous; phosphomolybdic acid, a yellowish-white flocculent precipitate; iodine water, or iodized iodide of potassium, a kermes-brown precipitate.

Dilute acids do not alter cocaine, but concentrated acids (sulphuric, etc.) change it into *ecgonin*, benzoic acid, and methyl alcohol, or rather the ether of the latter. Ecgonin is a product of the decomposition of cocaine, and not a natural constituent of coca leaves.

Cocaine combines easily with dilute acids, forming easily crystallizable salts, which are soluble in alcohol, but *insoluble in ether*, have a bitter taste, and leave a transient sensation of insensibility upon the tongue.

Hydrochlorate of cocaine, $C_{17}H_{21}NO_4HCl$, separates from its aqueous solution in short transparent prismatic crystals which are permanent in the air.

Acetic acid dissolves cocaine readily, but on evaporation the base separates again in crystals. Niemann took these for the acetate.

Nitrate of cocaine crystallizes with great difficulty.

Neutral sulphate of cocaine is a transparent gummy mass, becoming only slowly crystalline.

Cocaine is accompanied, in the coca leaves, by a volatile and liquid alkaloid, which remains behind when the aqueous extract, supersaturated with soda, is shaken with ether. It may be separated by distilling the aqueous liquid, or by distilling the leaves with water. It has an odor resembling that of trimethylamine, has a bitter taste and an alkaline reaction, but is not poisonous.

Schroff, who made the first experiments with cocaine, in 1862, observed that it caused fluctuation in the respiration and pulse, and produced mydriasis. Fronmüller (1863) found that it had but little effect in man, in doses of 0.03 to 0.33 gm. (½ to 5 grain), and in the case of an attempted suicide, 1.5 gm. (24 grains) did not even produce serious results. The fatal dose, therefore, seems to be much higher, unless the cocaine used in those days was very impure.

Cocaine—Chemical Constitution.—The chemical constitution of cocaine is the subject of a communication to the Academy of Sciences by Messrs. Calmels and Gossin. The authors have verified the decomposition of cocaine, when heated, into benzoic acid and a neutral body.

Ecgonine, forming compounds with acids and alkalies. By the decomposition of ecgonine another base is obtained, which is an

Isotropine, and splits up upon further treatment into ethylamine and a non-nitrogenous oil, just as tropine, the basic constituent of atropine, splits up into methylamine and a similar oil. It follows, therefore, that cocaine, ecgonine, and isotropine are derivatives of ethyltetrahydropyridine, the same as tropine compounds are derived from the corresponding methyl compounds, the steps being thus described: isotropine is metholethyltetrahydropyridine; ecgonine is metholethyltetrahydrodine-carbonic acid; and cocaine is a di-ether of the preceding, methylic benzometholethyltetrahydropyridine carbonate.—Compt. Rend. c., 1143; Phar. Jour. and Trans., May 30, 1885, 986.

Cocaine—Preparation, etc.—In the November number of "Ephemeris" (1884), Dr. E. R. Squibb draws attention to the anæsthetic value of cocaine, this property having a short time previously (about the middle of September) been discovered by Mr. Koller, a medical student of Vienna. The author records some experiments made by him in reference to this peculiar property, which are confirmatory of the previous observations of Mr. Koller and others. The alkaloid having so far been employed only in form of solution (principally of its hydrochlorate), the author suggests the use of an

Oleate of Cocaine, the alkaloid uniting readily with oleic acid, and forming a true salt. No formula is, however, given. In a subsequent paper (Ephemeris, Jan. 1885, 717–740), the author enters very exhaustively into the methods used for the preparation of

Hydrochlorate of Cocaine, the assay process, description and tests of alkaloid and salt, proper preparation of its solution for use, the uses to which it is applied, etc., for much of which reference must be had to the original paper. Without entering into the details of the process adopted for the preparation of cocaine, which is a modification of Niemann's, it may be briefly stated to consist of extraction of coca with alcohol, containing sulphuric acid in the proportion of 13 grains to the pound, by percolation; removal of the alcohol by distillation; addition of water to the residue while still hot; removal of the aqueous solution from chlorophyll and other precipitable matter by means of a siphon; and shaking the aqueous solution, after rendering it alkaline with carbonate of sodium, with ether, the washing with ether being repeated twice. The ether being distilled off, an acid aqueous solution of the residual crude alkaloid is made, and this acid solution is now shaken with ether, in small quantities at a time, until it remains colorless. The acid liquid is then rendered alkaline with carbonate of sodium and shaken out with ether as before. The brownish yellow mass of crystals obtained on the removal of the ether by distillation is now dissolved in water by the aid of concentrated sulphuric acid, using 12 cc. of this to each 100 grammes of crystals, the solution being diluted to about 5 times the weight of the crystals, and this solution is decolorized by percolating it through purified animal charcoal, in reference to the proper condition of which the author makes some pertinent remarks (see *Purified Animal Charcoal*, under "Inorganic Chemistry"). The colorless percolate and washings contain the pure cocaine associated with the second and worthless alkaloid of coca—hygrine. Circumstantial directions are given for the removal of the latter. The pure alkaloid is eventually obtained in the form of light porous masses, from which the hydrochlorate is made by moistening it in a flat-bottomed vessel with water, adding strong hydrochloric acid cautiously to exact neutralization, and evaporating the concentrated solution of hydrochlorate at a low temperature. 100 parts of alkaloid yield 114 parts dry hydrochlorate. The yield of the latter from coca was in one case .27 per cent, in another .34 per cent. The author's process of assay is based upon his above process of manufacture.

The *hydrated alkaloid cocaine*, from the above process, is in light, white spongy fragments, or in light amorphous powder, very much like magnesia. It is not perfectly white, but very nearly so. It is nearly insoluble in water, but very soluble in acids, giving solutions that are not quite colorless. When a very small particle is laid upon the tongue, and the tongue is then held against the roof of the mouth, a moderately bitter taste is perceived in a few seconds. In a few seconds more the bitterness gives place to a numbness and insensibility of the surfaces, as though scalded by hot liquid, except that there is no pain. This numbness increases for a few minutes, and then diminishes slowly, and disappears in ten or twenty minutes, in proportion to the quantity applied.

The *hydrochlorate of cocaine*, from the above process, is an almost white crystalline powder, though the fragments of crystals are so small that it appears to be an amorphous powder, even under a glass of low power. The powder, when dry, is loose and mobile, but when exposed to damp air becomes a little damp and clammy, although it does not appear to be deliquescent. It is soluble in all proportions of hot water, and in alcohol, and in somewhat less than half its weight of cold water, its solution being not colorless, though appearing so in small vials. The solutions are neutral to test-paper.

In the March number of "Ephemeris" (1885), 750–759, Dr. Squibb discusses difficulties to be overcome by the

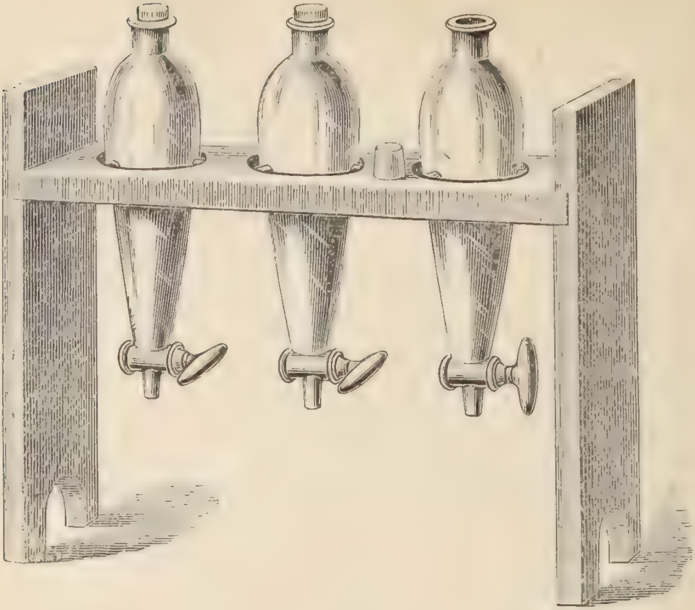
Oleate of Cocaine, gives a formula for its preparation, and records some experiments made with it upon the skin. The formula is as follows:

Take of Cocaine	1 part.
Oleic Acid	3 parts.

The two substances are weighed into a mortar and triturated, assiduously at first and occasionally after a time, until the cocaine is completely dissolved. The whole is then gently warmed, so that the oleate may be readily poured into the receiving bottle with the least possible loss. It is of a syrupy consistence, and not perfectly transparent when cold, though nearly so. The color is very nearly that of the oleic acid from which it is made.

Cocaine—Method of Assay.—Dr. E. R. Squibb gives his process for the assay of cocaine, which is equally applicable to the assay of other alkaloids, as follows: 50 grammes of coca in fine powder is moistened with 40 grammes of strong alcohol, to which has been added .08 gramme of sulphuric acid sp. gr. 1.843, or .16 gramme of hydrochloric acid sp. gr. 1.16, packed in a percolator, and if there be no haste, allowed to stand over night. It is then percolated with strong alcohol, not acidulated, until exhausted, or until the percolate amounts to 7 or 8 times the weight of the powder. The percolate is evaporated at a low temperature until free from alcohol. The residue extract is rinsed into a *separator* by the successive application of water and ether until about 25 or 30 cc. of each liquid have been used and the whole of the extract transferred. (The *separator* is shown in the accompanying cut (Fig. 64), representing a set of three, which number is useful, since it enables the transfer of the liquid from one separator directly into the other. The separator, in fact, is a combined shaking

Fig. 64.



Squibb's Separator for the Extraction of Alkaloids.

flask and separator, the cut representing them about one-fourth their actual size, their capacity being about 200 cc.). Next, 1 or 2 cc. of 10 per cent. acid is added, and the whole vigorously shaken. If this mixture forms an emulsion which does not separate within an hour or two, a further addition of acid, and a repeated agitation will cause a more prompt separation. The lower watery solution is drawn off into another separator, and the ether residue is washed with 10 cc. of acidulated water, this washing being added to the watery solution, and the ether residue being thrown away. The watery solution is next washed with successive portions of ether of about 10 cc. each, until the ether remains nearly colorless, as the liquids are separated from one separator to the other. Now add 10 cc. of fresh ether and an excess of crystals of carbonate of sodium, agitate well, draw off the watery solution into the other separator, and the ethereal solution into a small tared beaker. Wash the watery solution once more with 10 cc. ether, add the ethereal solution to the other, and set the beaker in a warm place, finally heating it until it no longer loses weight. The weight is then taken, and this may be accepted as the proportion of crude alkaloid. If the crystalline or varnish-like residue be washed twice successively with 5 cc. of distilled water, and then again dried and weighed, the assay will be closer. By this process of manufacture about 10 per cent. less than the quantity thus indicated will be usually obtained.—Ephemeris, May 1885, 781–788.

Hydrochlorate of Cocaine—Definition of Characters.—The Pharmacopœia committee appointed by the German Pharmaceutical Association have decided to recommend that hydrochlorate of cocaine shall be included in the next edition of the Phar. Germ., and have drawn up a definition of its characters, as follows: A white crystalline powder of feeble acid reaction, with a somewhat bitter taste, and producing in the tongue a highly characteristic insensibility that quickly passes away. The salt dissolves easily in water and in alcohol. In the aqueous solution a solution of iodine produces a red precipitate, and caustic alkalies a white crystalline precipitate, which dissolves with great difficulty in water, but readily in alcohol or ether. The compound is dissolved with frothing by concentrated sulphuric acid, but without undergoing change of color; nitric and hydrochloric acids also dissolve it colorless. When heated upon platinum foil hydrochlorate of cocaine should leave no residue; it should dissolve in double its weight of cold water, and should not become colored in contact with mineral acids.—Phar. Jour. and Trans., Dec. 27, 1884, 501.

Cocaine—Caution as to Old Solutions.—Mr. H. Fenwick cautions against using stale solutions of cocaine, since a fungoid growth is quickly developed in dilute (4 per cent.) solutions, which appear to have the power of setting up inflammation of the mucous membrane to which it may be applied. He points out that the epithelium is denuded by the action of the drug, and that the danger through the direct action of deleterious matter upon the tissues is consequently much increased. In stronger solutions (20 per cent.), the fungoid growth does not seem to develop so readily.—Lancet, Jan. 1885, 224; Phar. Jour. and Trans., Feb. 28, 1884, 693.

Cocaine—Preservation of Solutions.—Dr. E. R. Squibb records experiments made with a view to determining the best and most suitable preservative agent for solutions of cocaine. He finds that the addition of 0.5 per cent. of boric acid will protect such solutions for a reasonable length of time, and is not objectionable. Indeed, he thinks that even 1.0 per cent. may be safely used. He regards it preferable to camphor water, recommended in some of the British journals.—Ephemeris, May 1885, 795–799.

Cocaine and Its Salts—Characters, Uses, etc.—Mr. E. Merck communicates a paper on cocaine and its salts, in which he chiefly considers the therapeutic characters of this alkaloid in as far as these have hitherto been observed. The interest that at present attaches to this substance justifies the following brief extraction, relating mainly to the characters of the alkaloid and its salts:

Cocaine, $C_{17}H_{24}NO_4$ (according to Lossen), is the alkaloid contained in coca leaves (*Erythroxylon Coca*, Lam.), which was first isolated by

Niemann in 1860. In 1862, Lossen discovered in the same leaves a second principle, hygrin, which is of a volatile nature, and has been hitherto but little investigated, but it appears to have a weak and hardly characteristic action. The further component parts of the coca leaves appear to be ecgonin, coca-tannin, and a peculiar wax.

The cocaine crystals belong to the monocline system, melt at 98° C., are easily soluble in alcohol, even more easily soluble in ether, but only dissolve in 704 parts water. The salts of cocaine are, on the other hand, readily soluble in water. The salts prepared commercially are the hydrochlorate, salicylate, hydrobromate, tartrate, and citrate.

Since the discovery of cocaine the belief has gained ground, and, as it appears, quite correctly, that this alkaloid is the really active principle of coca leaves. At first it was believed, apparently with good grounds, that it possessed a property analogous to that possessed by caffeine, theine, and theobromine, viz., the power of retarding or stopping the change of tissue; but hitherto no facts absolutely confirming this theory have been discovered.

One of the most important properties of cocaine is that when it is brought into immediate contact with the mucous membrane, it seems to produce temporary insensibility to feeling, and trials have been made with it not only in cases of disease of the throat, windpipe, etc., but results have also been obtained in the direction of producing local anæsthesia for the purpose of operations on the mouth, throat, etc. Cocaine will also probably come into important and frequent use in cases of ophthalmia.

Which of the cocaine salts is preferable for the purposes of eye surgery remains to be proved, and will probably be positively ascertained very shortly. Most of the experiments so far recorded have been made with the hydrochlorate. Dr. von Hoffmann, of Baden-Baden, an ophthalmologist, recommends cocaine salicylate for ophthalmic purposes. Cocaine citrate has been successfully used by dentists for the purpose of anæsthetizing the dental nerves. This salt can be readily formed by kneading into pills, which, after being wrapped in wadding and moistened, are placed in the hollow tooth, which can then be cleaned or extracted comparatively, or even totally, without pain.

Cocaine splits up with concentrated hydrochloric acid into ecgonine, benzoic acid and methyl alcohol. Experiments are now being made as to the physiological action of ecgonine.—Amer. Jour. Phar., Jan. 1885, 31–34; from Phar. Jour. and Trans., Nov. 1884, 426.

Hydrochlorate of Cocaine.—The recent discovery of the peculiar power of this substance to produce local anæsthesia, has induced Mr. L. E. Sayre to interview the leading oculists of Philadelphia, with a view to obtaining reliable information concerning this new agent. The information so collected, being mainly of a therapeutic character, will be found in Amer. Jour. Phar. (Dec. 1884, 609–614.) The author also communicates the following formula for the preparation of the alkaloid, which was given him by Mr. M. Eisner, and which appears to be substantially that of Mr. Niemann, published in Amer. Jour. Phar. (1861, 131): Displace coca leaves with dilute alcohol and a small quantity of sulphuric acid. Add calcium hydrate to the percolate, neutralize with sulphuric acid, distill off the alcohol. Dissolve the residue in water, and filter; add sodium bicarbonate to the filtered liquid, and wash with ether, adding a small quantity of muriatic acid. The ethereal solution will deposit the hydrochlorate of cocaine in an amorphous mass, gradually crystallizing. Purify by dissolving in water, precipitating with sodium bicarbonate and washing with ether, and leave it to crystallize out of the ethereal solution.

Hydrochlorate of Cocaine—Hypnotic Value.—The hydrochlorate of cocaine and the fluid extract of coca, have been lately used at Westminster Hospital to procure sleep. In one patient three minims of a 4 per cent. solution (equal to $\frac{1}{8}$ of a grain), administered hypodermically, produced sleep. Two drachms of the fluid extract of the leaves were required to produce the same effect, producing natural and undisturbed sleep. In a case of rheumatism the dose of the hydrochlorate was double, and the fluid extract was given to the extent of five drachms for a dose, without any bad effect. The hydrochlorate has also been used successfully for tinnitus aurium, a 4 per cent. solution being dropped into the ear.—Brit. Med. Jour., Dec. 20, 1884, 1240; Phar. Jour. and Trans., Dec. 27, 1884, 501.

Dr. E. Caldwell, of the above-named hospital, has experimented on himself with large doses of cocaine and of the "valoid" of coca (a fluid extract equivalent to its weight of the leaves). The dose of the latter was increased from 2 drachms to 2 ounces. The last-named dose caused giddiness and unsteadiness of gait for ten minutes, and then a general sensation of well-being, with considerable mental excitement and ability to read steadily for many hours, and to keep awake all night. With Merck's hydrochlorate of cocaine, he commenced by taking $\frac{1}{2}$ a grain, and increased the dose to 5 grains, which caused toxic symptoms; these, however, passed off in about two hours, except the dilatation of the pupils of the eyes, which lasted for six hours. From his experiments he concludes that coca and cocaine exert a double action, being cerebral sedatives in small doses and cerebral stimulants in large doses; that cocaine given internally dilates the pupils, and that it possesses no toxic action except in large doses.—Brit. Med. Jour., Jan. 3, 1885, 17; Phar. Jour. and Trans., Jan. 31, 1885, 613.

Cocaine.—Mr. Charles Symes has read a paper before the Liverpool Chemists' Association, in which he reviews the characters, medicinal applications, etc., of cocaine. The character of the hydrochlorate as now furnished by manufacturers he finds to vary according to its condition of neutrality or acidity, the earlier samples being slightly acid and damp, and yielding 75 per cent. of alkaloid, whereas it is now furnished in a dry neutral state, and yields 85 per cent. or over. The simple aqueous solution becomes flocculent and spoils after about three weeks, but it has been shown that a solution in camphor water not only keeps well, but is equally effectual. As regards the statements that coca leaves deteriorate by keeping, the author is not prepared to contradict the statement, but a quantity of leaves which, to his knowledge, had been kept for twelve months, yielded alkaloid to the amount of 14 grains per pound. As regards the exhibition of cocaine, it has been used, besides in the form of aqueous solution, in suspension with oil, in the form of suppositories, and as oleate. The oily mixture of the hydrochlorate, when properly prepared, contains the compound in a finely divided state, and is found efficient, though it is not, as sometimes called, a solution. The *oleate*, which is employed of the strength of 5%, is best prepared by diluting a 10 per cent. oleate of cocaine with oil of almond to the desired strength, in order to avoid excess of oleic acid. This is, properly speaking, a solution. *Suppositories* are made to contain from ½ to 2 grains of cocaine each. The author suggests that these should be made smaller than usual—say 5 grains—while pessaries should not exceed 15 grains in weight.—Phar. Jour. and Trans., April 4, 1885, 813, 814.

Cocaine—Value in Ophthalmic and General Surgical Practice.—Dr. Hermann Knapp has contributed a paper on cocaine, in which he draws attention to the value of this new remedy in the treatment of the different diseases of the eye, as well as in general surgery. He regards it as one of the most important additions to medicine, and believes that it will maintain its high value as a local anæsthetic so long as another remedy of still greater power, and equally innocuous, shall not have been discovered.—Pharm. Rundschau, Jan. 1885, 2–4.

Cocaine—Additional Properties.—According to Messrs. Randolph and Dixon, cocaine, in addition to its now well-known property of dulling the sensibility of the mucous membrane, is capable of being used to counteract the pain of acids when used as caustics. They state that when a saturated solution of hydrochlorate of cocaine in strong nitric acid is applied to the skin a slight prickling sensation is developed, but that the consequences of the application cannot be said to be painful. The ultimate result is described as being similar to that following the application of nitric acid alone, but the time required for the formation of a deep eschar is considerably longer.—Phar. Jour. and Trans., May 2, 1885, 689; Ther. Gaz., Mar. 1885, 200.

Cocaine—Antagonism to Morphine.—Attention is directed to the antagonism between cocaine and morphine, and to the value of cocaine for allaying the craving for morphine in the habitual consumer of opium or morphine. It is suggested that the different results that have been obtained in the use of cocaine for this purpose, may be due to the differences in the alkaloid employed. It has been observed that the alkaloid of one manufacture, which was of good color and appearance, produced nausea, while a darker and more granular alkaloid did not do so. The last named is scarcely aromatic at all, and a 5 per cent. solution is absolutely clear; while the former is strongly aromatic, and a solution of the same strength is not quite transparent.—Pharm. Post, Jan. 17, 1885, 78; Phar. Jour. and Trans., Jan. 31, 1885, 613.

Hydrochlorate of Cocaine—Use in Tubercular Disease.—A case, suggestive of the possible use of cocaine, is reported in the "Medical Times" (Nov. 29, 1884, 755). The patient suffered from tubercular disease, and for nearly two months had only been able to swallow even milk in the minuter quantities, deglutition being so extremely painful. After his throat had been painted with solution of cocaine, he was able to make an excellent meal.—Pharm. Jour. and Trans., Dec. 27, 1884, 501.

Cocaine—Uses.—Dr. Jelinek obtained temporary relief in a case of painful deglutition, by applying to the back part of the mouth a ten per cent. solution of cocaine (Wiener Med. Woch. Schr.) Dr. Murrell has used cocaine hydrochlorate in neuralgia, relief being afforded by hypodermic injection; but he prefers a 20 per cent. solution of the salt in oil of cloves, of which from 5 to 10 minims are rubbed in with the finger. —Amer. Jour. Phar., Feb. 1885, 78; from Brit. Med. Jour.

Caffeine—Percentages in Different Samples of Tea and Coffee.—Dr. E. R. Squibb, in continuation of his plea for tea and coffee as substitutes for guarana and coca, communicates the results of some assays of different samples of the two first mentioned, as well as some modifications adopted in the process of assay. His results with teas were as follows:

A fancy high-flavored Formosa Oolong	contained	3.10%	caffeine.
Extra fine small-leaf Gunpowder	"	3.51%	"
Formosa Oolong	"	2.80%	"
"	"	2.74%	"
Basket-fired Japan	"	2.80%	"
" "	"	2.87%	"
Amoy Oolong, large-leaf	"	2.95%	"
Congo, large, crane-leaf, North China	"	2.41%	"

The above series embraces representatives of the tea market from the very highest to the very lowest prices and qualities, ranging in price from 20 cts. to 85 cts. per pound. Teas sold below 20 cts. per pound are said to be mere dust or refuse from better grades, or imitation of tea made from other plants. It will be observed that the Congo tea, which is the lowest-priced (20 cts.) contains within .7 p. c. of the caffeine of fancy Formosa Oolong (85 cts.), and that this latter does not contain the most caffeine.

The following list of coffees does not embrace half the principal grades of the market. As in the case of tea, the kinds of coffee are given in the order of the market value, beginning with the the highest (23 cts. per pound) and ending with the lowest (10 cts. per pound). The same disparity between market value and yield of caffeine will be observed here as in the case of tea, but the caffeine value is much more uniform than in tea, the difference between the extremes being here only .3 per cent., while in tea it is 1.1 per cent.

The results are as follows:

Mocha, an Arabian coffee	yielded	1.05%	of caffeine.
"	"	1.07%	"
Mandheling Java.	"	1.30%	"
" "	"	1.22%	"
Interior "	"	1.10%	"
Maricaibo	"	1.20%	"
Rio, strong and rank	"	1.00%	"
"	"	1.05%	"

The aroma of coffee being developed entirely by the roasting, and the quality of this aroma being its chief element of value, the author has made some experiments as to the best method of conducting this operation, and also to note the loss occasioned in roasting, as well as the percentage of caffeine retained after the roasting. Old Mandheling Java was selected for this purpose. It was carefully roasted to a full but not dark chestnut-brown color, the color being very uniform throughout. When thus lightly roasted, the aroma is strongest and best. The loss was just 13 per cent., which, however, is below the average loss recorded by professional coffee roasters, who find the average to be 16 per cent., and the extreme being 18 per cent. Another lot, from a different source, lost 15 per cent. Two varieties of coffee were selected for the determination of caffeine before and after roasting. The results were as follows:

The Mandheling yielded from the green 1.22%; from roasted, 1.45% caffeine.
" Interior " " 1.14% " 1.40% "

This shows a gain of caffeine, if the loss—13%—be allowed for, which gain may perhaps be accounted for that the caffeine from the roasted was of a darker color, and more oily than that from the same green coffee. It seems to prove, however, that properly roasted coffee loses no caffeine in the process of roasting.—Ephemeris, Sept. 1884, 637–647.

Caffeine and its Double Salts.—Mr. E. Merck draws attention to caffeine and a number of its double salts. These are prepared in fixed equivalent proportions, so that for instance caffeine sodium benzoate contains 50% caffeine, (1.0 gramme of the double salts=0.5 gramme pure caffeine), the caffeine sodium cinnam[yl]ate, and salicylate 62.5% caffeine (1.0 gramme of the double salts = 0.625 gramme pure caffeine). All three combinations are readily soluble in two parts of water at the boiling point; the solutions remain perfect also on cooling to 0° C., even if shaken.—Amer. Drug., Aug. 1884, 143.

Caffeine.—Percentage in different samples of *Brazilian Coffee*, which see under "Materia Medica."

Caffeine.—Occurrence in *Ilex Cassine*, L., which see under "Materia Medica."

Caffeine—Comparative Physiological Effects.—Dr. E. R. Squibb, in his paper on fluid extract of green coffee (Ephemeris, July 1884, 616–619) sums up the equivalency in effect of artificial caffeine, coca leaves, tea, guarana and green coffee, as follows:

Of artificial caffeine 3 grains is equivalent to 180 grains of coca, which contains about .45 grains of cocaine;—and to 70 grains of tea, containing 2 grains of caffeine;—and to 60 grains of guarana, containing 2.6 grains of caffeine; and to 150 grains of coffee, containing 1.95 grain of caffeine.

Hymenodictyonine—Chemical Characters.—In continuation of his previous papers (see Proceedings 1883, 137, and 1884, 166), Mr. W. A. H. Naylor communicates some further investigations of the alkaloid of *Hymenodictyon excelsum*, which are directed more particularly towards determining its molecular weight. In addition to the description previously recorded, the author observes that by extremely slow evaporation of its ethereal solution, the alkaloid assumed a distinctly crystalline form; also, that when placed in contact with sulphuric acid, the solution assumed a lemon-yellow color, passing to a wine-red and ultimately deep claret by transmitted light; by reflected light it presented a bronze appearance. Ultimate analysis of the pure substance gave results which led the author to adopt the formula $C_{23}H_{40}N_2$. The hydrochlorate and platino-chloride of the alkaloid have been prepared and are described. Also the ethyl derivatives of the new substance, which show the *diammonic* nature of hymenodictyonine, and lead to the inference that it is a *tertiary diamine*, having the molecular weight represented by the formula above given.—Yearbook of Pharmacy, 1884, 500–504.

Betaine—Occurrence in Cotton Seed.—H. Rittenhausen and F. Weger have found *betaine* (discovered by Scheibler, in 1866, in the juice of the sugar cane), in the mother liquor from which melitose, from cotton seed, had been separated. The authors have not yet ascertained in what form the alkaloid occurs in cotton seed.—Amer. Jour. Phar.. Mar. 1885, 148; from Jour. f. prakt. Chem., xxx., 32–37.

Cannabine—Preparation from the Tannate.—Mr. Eugene Bombelon, in view of the indefinite composition of the tannate, proposes to abandon its use and to employ the pure cannabine instead. He first prepares the tannate by precipitation, then decomposes this with oxide of zinc, and extracts the cannabine, which is obtained as a greenish-brown, air dry non-adhesive powder, volatile without residue upon platinum foil. It is a prompt soporific in doses of 0.05 to 0.1 gm., without previous excitation; the tannate acts very unequally, and is only effective in large doses of 0.3 to 1 gm., and even more.

Pure cannabine is tasteless, entirely insoluble in water, but easily soluble in alcohol, ether and chloroform.—Amer. Drug., July 1884, 132.

Nicotine—Estimation in Tobacco.—Prof. E. Scheffer, who has had occasion to make numerous estimations of nicotine in tobacco, has made the observation that dilute solutions of nicotine require a larger proportion of Mayer's solution for complete precipitation than more concentrated solutions. He now records numerous experiments made with a view to account for this anomaly, and finds that under certain conditions the precipitate of iodohydrargyrate of nicotine is liable to assume a resinous form, in which condition it is not definite in its composition, and a larger quantity of the test solution is required. This liability to form a resinous instead of crystalline precipitate is particularly favored by the greater dilution of the solution.

The author, furthermore, finds that Dragendorff (in his "Werthbestimmung einiger starkwirkender Droguen, St. Petersburg, 1874), gives the amount of nicotine indicated by 1 cc. of Mayer's solution too low, and that it should be just twice as large. This error, he believes, is due to the general acceptance in text-books of an erroneous formula for the hydrochlorate of nicotine $C_{10}H_{14}N_2(HCl)_2$, whilst the formula for the sulphate $C_{10}H_4N_2HO,SO_3$ (old notation), is correctly given.—Amer. Jour. Phar., Oct. 1884, 497-503.

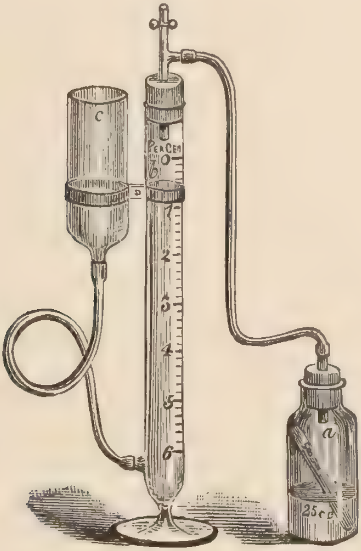
Choline.—Relation to Ptomaines.—L. Brieger has obtained from human cadavers which were only in the incipient stages of decomposition, a compound which was recognized, from its double platinum salt and especially its double gold salt, as *choline* (that is, trimethyl-oxy-ethene-hydrin-ammonium-hydroxide), and he arrived at the conclusion that no other poisonous substance is probably present in the incipient stage. After a time, however, more intensely poisonous substances must be developed, which are not yet isolated and studied. Some of them appear to possess the characteristic toxic effects of muscarine (the alkaloid of the poison-mushroom).—Amer. Drug., March 1885, 48; from Ber. d. Deutsch. Chem. Ges.

Choline—Occurrence in Hops.—Drs. Griess and G. H. Harrow have separated choline, $C_2H_4(OH).NMe_3.OH$, from hops by adding to a concentrated extract, acidified with chlorhydric acid, a solution of iodine in iodhydric acid. The semi-solid precipitate obtained, a choline periodide, was boiled with water to expel iodine, and the resulting solution of choline iodide treated with silver oxide; the impure choline in the solution was then converted into the auro-chloride, which was recrystallized. In this manner they have not been able to obtain more than $\frac{1}{50}$th per cent. of choline from hops. They consider it not improbable that it exists in loose combination with resin, as they find that a very dilute aqueous solution is capable of dissolving comparatively large quantities of hop resin, the liquid being then of an intensely bitter taste. Employing the same method, they have also extracted choline from beer.—Chem. News, March 27, 1885, p. 149.

Kairine—Excretion.—Petri and Lehmann ascertained that kairine, or hydrochlorate of oxyquinolinethyl hydride is found in the urine as an ethersulpho acid, which is not destroyed during the ammoniacal fermentation of the urine, but is slowly decomposed by long-continued boiling with hydrochloric acid. Its solution, slightly acidulated with acetic acid, acquires, with a solution of chlorinated lime, a beautiful fuchsin red color, which begins to fade after about 30 minutes.—Amer. Jour. Phar., Mar. 1885, 152, from Centralbl. Med. Wiss., 1884, p. 305.

Urea—Simple Apparatus for Estimation.—Mr. A. W. Gerrard recommends the simple apparatus shown by Fig. 65, which he finds to be as accurate for the determination of urea as the more complicated apparatus generally employed. The bottle *a* contains a test tube graduated to 5 cc.; it is connected with *b* by means of caoutchouc corks and tubing; *b* is further connected by caoutchouc tubing with a glass vessel *c*. The two glass vessels *b* and *c* are held together by a sliding spring clamp, allowing

FIG. 65.



Gerrard's Urea Apparatus.

c to be moved freely up and down. The method of using the apparatus is given as follows: The glass vessels *b*, *c*, are filled with water to the zero line; then inside the bottle *a* is placed 25 cc. of a solution of hypobromite of soda, and inside this bottle is a test-tube, as seen in the illustration, containing 5 cc. of the urine to be examined. Fix the caoutchouc corks securely, so that no air can enter at any of the joints, and see that the water is at zero; if not, open the small pinch-cock at the top of *b*, and the water will at once return to zero; then close the pinch-cock. Take the bottle *a* in the hand, and incline it so that the urine upsets into the hypobromite; effervescence at once follows, and the evolved nitrogen forces the water from the glass vessel *b* into the glass *c*. The end is known by the cessation of effervescence; then the bottle *a* is placed into cold water, to reduce the expansion caused by the heat of the reaction. When all is cool, as seen by the steadiness of the water, the tube *c* is lowered by means of the sliding clamp until the levels of the water are equal, thus balancing pressure. The operation is now finished, and the figure at which the water rests in *b* is read, and represents per cents. of urea. The instrument is graduated in tenths, so that if the water stood two lines below 3 the quantity of urea shown would be 3.2 per cent. To prepare the hypobromite of soda, 100 grams of caustic soda is dissolved in 250 cc. of water, and to 23 cc. of this solution 2.2 cc. of bromine is added, giving the exact quantity for the analysis of 5 cc. of urine.—Phar. Jour. and Trans., Dec. 13, 1884, 464, 465.

Pyridine—Value in the Treatment of Asthma.—Prof. G. Sée has obtained favorable results by the employment of pyridine in the treatment of asthma. The best method of administration has been found to be by inhalation. For this purpose four or five grams are poured on a plate placed in a closed room of not more than 25 cubic meters capacity. The air in this confined space becomes saturated with the alkaloid, and upon being breathed by the patient, the pyridine rapidly passes into the blood, and its presence can be very soon demonstrated in the urine. The inhalations last from twenty to thirty minutes, and are repeated three times a day. The patients are said to quickly experience a marked diminution of oppression, and the symptoms generally rapidly improve.—Phar. Jour. and Trans., June 27, 1885, 1067; Nouv. Rem., June 1885, 121.

Antipyrin—Nature and Source.—Dr. Knorr throws some light on the nature and source of the substance which, under the name of "antipyrine," has been introduced as possessing remarkable power in lowering the temperatures of fever. The communication bristles with technicalities, but the salient points appear to be the following: Antipyrin, according to the author, is one of a series of derivatives from a hypothetical base to which he has given the name of

Chinizin, representing it by the formula $C_9H_{10}N_2$. These chinizin derivatives are products of the action of diacetic ether upon one of the hydrazines, a class of bodies represented as containing the nitrogen group $=N-N=$, of which the free affinities are saturated either by hydrogen or alcohol radicals.

Phenylhydrazin ($C_6H_5.H.\ N-.N.\ H.\ H$) is obtained by the reduction of diazobenzol sulphonate with sulphurous acid. When equal molecules of it and diacetic ether react in the cold, the elements of water are eliminated and the residue combines to form

Phenylhydrazin-diacetic ether, which, upon being heated to 100° C, parts with the elements of ethylic alcohol, and is converted into

Methyloxychinizin. This possesses the properties both of an acid and a base. But it still contains an atom of hydrogen easily replaceable by an alcohol group, and the compound then loses its acid character and is converted into a base with a strongly antipyretic action. The conversion may be effected by heating in a tube to 100° C, a mixture of equal parts of methyloxychinizin, methyl iodide and methyl alcohol, decolorizing the product by boiling with sulphurous acid, distilling off the alcohol, treating the residue with strong soda lye, shaking the heavy oil that separates with ether, and evaporating, when

Dimethyloxychinizin ($C_{11}H_{12}N_2O$) separates in lustrous crystals melting at 113° C. This appears to be the compound to which Dr. Knorr has given the name "antipyrin"; but it must not be confounded with another compound, to which he has given a similar systematic name, di-methyloxychinizin, differing only by the introduction of a hyphen. The latter compound is a condensation product of two molecules of methyloxychinizin, represented by the formula $C_{20}H_{18}N_4O_2$ —Ber. d. D. Chem. Ges., xvii, 2032; Phar. Jour. Trans., Nov. 1, 1884, 341.

Antipyrin—Liability to Produce Exanthema.—Dr. Ernst reports that he has observed in five cases the occurrence of exanthema during the administration of "antipyrin." The eruption, which occurred on the chest, stomach, and back, is described as consisting of small, reddish, irregularly-circular spots, resembling closely those of rubeola. The spots are confluent, and the patches formed, being separated by divisions of sound skin, present the appearance of rose-marbling. When pressed, the red color disappears, leaving a brown pigmentation. The eruption increases in intensity of color for about five days, when the red gives way to a brown color, and, after a time, the exanthema disappears without the administration of antipyrin being discontinued. — Rép. de Pharm., Dec. 1884, 563; Phar. Jour. and Trans., Dec. 27, 1884, 501.

Thailin—A New Antipyretic.—Among the chinoline derivatives prepared by Professor Skraup, a secondary base, represented by the systematic name

Tetrahydroparachinanisol, has been introduced under the name of "thallin," and is said to have been used successfully as an antipyretic in a large number of cases in the clinic of Professor Nothnagel. The salts of this base, which have an acid reaction, are all freely soluble in water, and have the property of forming green compounds when treated with ferric chloride and oxidizing agents, whence the shorter designation "thallin." The hydrochlorate, sulphate, and tartrate of thallin and the hydrochlorate of ethylthallin have been used, and these are said to have shown great antipyretic activity in doses of one-quarter, one-half, and three quarters of a gram. The lowering of the temperature is said to take place gradually, and to last a considerable time, whilst it is not accompanied by any secondary disturbances.—Phar. Jour. and Trans., Nov. 29, 1884, 421; Pharm. Post, Nov. 1, 1884, 1038.

Thalline—Therapeutic Uses.—This base, which is said to have been used successfully in a large number of cases in the clinic of Professor Nothnagel, has the constitution of a secondary chinoline base, being one of a number of chinoline derivatives prepared by Professor Skraup, and is represented by the systematic name "tetrahydro-parachinanisol." The salts of this base, which have an acid reaction, are all freely soluble in water, and have the property of forming green compounds when treated with solution of ferric chloride and oxidizing agents. On account of this peculiarity, the cumbrous systematic name has been dropped in favor of the shorter designation "thalline" (θαλλός). The hydrochlorate, sulphate and tartrate of thalline, and the hydrochlorate of ethylthalline, are the salts that have been used, and these are said to show great antipyretic activity in doses of quarter, half and three quarters of a gram, a point in which thalline would seem to compare favorably with some of its competitors. The lowering of the temperature is said to take place gradually and to last a considerable time, whilst it is not accompanied by any secondary disturbances. Thalline can be conveniently administered in wafers containing a quarter or half a gram of the sulphate. — Amer. Jour. Phar., Feb. 1885, 88; from Phar. Jour. and Trans., November 29, 1884; Phar. Post.

Naphthylamine.—Delicacy as a test for *Nitrous Acid*, which see.

Phenolphthalein—Commercial Inferiority.—Mr. Guyot has observed this compound adulterated with turmeric and with sulphate of sodium. These samples contained 16, 18 and 21 per cent. of sulphate of sodium respectively.—Phar. Jour. and Trans., June 27, 1885, 1067; Rép. de Phar., June 1885, 264.

Phenolphthalein—Value as an Indicator in Alkalimetry.—Professor Flückiger, following up the experiments of Mr. Thomsen (see Proceedings 1884, 226), has found that under all conditions ammonium salts behave towards a solution of phenolpthalein as if they contained free acid. The explanation suggested is that in aqueous solution these salts undergo dissociation, somewhat in the same manner as dry sal-ammoniac is known to do when heated, and that then the action of the liberated acid upon the phenolphthalein is unmodified by the base, in accordance with Mr. Thomsen's observation respecting ammonia. In like manner a number of salts of quinine, morphine, codeine, strychnine and brucine, were found to behave like acids in decolorizing a solution of phenolphthalein previously reddened by the addition of an alkali, and the probability of the explanation suggested is strengthened by the fact that no solid alkaloid, either in alcoholic or aqueous solution, appears to be capable of reddening a colorless solution of phenolphthalein. Whether the liquid alkaloids behave differently has not yet been determined. A sample of coniine reddened a solution strongly, and one of nicotine only very faintly. On the other hand, a faintly alkaline solution was sluggishly decolorized by hydrobromate of coniine.—Arch. d. Pharm. xi, 605; Phar. Jour. and Trans., Sept. 27, 1884, 243.

Gallein (Pyrogallol-phthalein)—Value as an Indicator in Volumetric Anelysis.—Mr. M. Dechan draws attention to gallein, which has for some years been used to a limited extent as a dye, as an indicator in the volumetric analysis of alkaline compounds containing carbonic acid. The solution employed by the author is prepared by dividing 1 gram of the powdered gallein in a litre of proof spirit. This gives with distilled water a pale brown coloration, which is changed by traces of alkaline to pink. The reaction is quite delicate, and not interfered with by the presence of carbonic acid. Even alkaloidal bases, which gave no reaction with phenolphthalein, yielded a sharp pink coloration, and carbonates, which prove neutral to the latter compound, readily produce the characteristic pink coloration with gallein. The following table shows the reactions obtained with the different bases and their compounds, those marked "*n*" being neutral to phenolphthalein:

	Hydrates.	Carbonates.	Bicarbonates.
Sodium	Bluish pink.	Reddish pink.	Bright pink, *n*.
Potassium.	Bluish pink.	Reddish pink.	Bright pink, *n*.
Ammonium	Bluish pink.	Reddish pink.	Bright pink, *n*.
Calcium	Bluish pink.	Reddish pink, *n*.	Bright pink, *n*.
Magnesium	Bluish pink.	Reddish pink, *n*.	Bright pink, *n*.
Barium.	Bluish pink.	Reddish pink, *n*.	Bright pink, *n*.

Other examples are given in which the gallein was found to be superior to litmus, phenolphthalein, methyl-orange, etc. The formation of gallein is the result of heat on a mixture of pyrogallic acid and phthalic anhydride, the temperature necessary to enable combination to take place being 190° to 200° C. As thus obtained it is a reddish-brown amorphous mass, readily pulverizable, but little soluble in alcohol, from which it may be obtained in crystals which appear green by reflected light.—Phar. Jour. and Trans., April 18, 1885, 849.

Para-amido-benzol-azodimethyl-aniline—A Delicate Reagent for Nitrous Acid.—Mr. Raphael Meldola has found that a dilute solution of this derivative of *paranitraniline* has the property, when coming in contact with nitrous acid (which see) and air or oxygen, of acquiring a blue color, and recommends it as a reagent. The author describes the mode of its preparation, and gives the chemical relations of the new substance. It is in form of a dark orange-colored powder, which should be completely soluble in dilute hydrochloric acid.—Ber. d. Deutsch. Chem. Ges., vol. 17, 256.

Red Aniline—Testing in Red Wines.—So long as the ordinary fuchsin (hydrochlorate of rosanilin) was alone employed as coloring matter for the purpose of imitating genuine red wines, the process of Falières was sufficient to recognize the sophistication. This consists in shaking 100 cc. of the wine with ether both before and after supersaturation with ammonia. The ethereal liquid, when evaporated in a porcelain capsule with a slight excess of acetic acid and some fibres of uncolored silk, should not impart a crimson or violet color to the latter. This process has also been adopted as one of the tests for the purity of red wine in the U. S. Pharmacopœia.

C. H. Wolff has lately pointed out that this process is entirely useless in the case of red wines which have been colored with the so-called *acid fuchsin* or *fuchsin S.* (sodium rosanilinsulphonate), as this coloring matter, when shaken with ether either in acid or in alkaline solution is insoluble therein. R. Kayer was the first (1881) who drew attention to the use of this coloring matter, as being more uniform in composition, and having a much more natural wine-color. "Fuchsin S." is not precipitated by basic acetate of lead; the solution, acidulated with acetic acid and shaken with amylic alcohol, yields to the latter a red color, which when examined (in this solution) by the spectroscope, is found to give the absorption spectrum of fuchsin.—Amer. Drug., Feb. 1885, 36; from Pharm. Centralh.

Poirier's Soluble Blue, C. 4 B.—Use as an indicator in *Alkalimetry*, which see under "Inorganic Chemistry."

GLUCOSIDES AND NEUTRAL PRINCIPLES.

Saligenin—Synthesis.—Mr. W. H. Greene describes a new synthesis of saligenin, effected by the reaction of chloride of methylene upon phenol in the presence of sodium hydrate. The process is a variation of one described by Messrs. Reimer and Tiemann, in which salicylic acid or salicylic aldehyd is obtained through the reaction of chloroform or tetrachloride of carbon upon carbolate of sodium.—Chem. News, Aug. 13, 1884, 76; Phar. Jour. and Trans., Aug. 30, 1884, 162.

Digitalin, Digitalein and Digitin—Separation and Estimation.—Mr. R. Palm proposes to exhaust digitalis with water, to filter through animal charcoal until entirely decolorized, and to precipitate the filtrate completely with lead acetate and alcoholic ammonia as long as a precipitate is produced. This last precipitate consists of lead oxide and the glucosides of digitalis. It is washed on the filter, mixed up with water to a thin paste, and completely decomposed by treatment with hydrogen sulphide. The entire mass is then placed upon a filter. The watery liquid contains all the digitalein, whilst digitalin and digitin remain undissolved in admixture with the lead sulphide. If this residue is treated with chloroform, the digitalin is dissolved, and can be obtained in crystals on evaporating the solvent. The residual lead sulphide is treated with alcohol, which dissolves the digitin. This substance remains behind in a state of purity on the escape of the alcohol. The lead precipitate of digitalin may be distinguished from those of picrotoxin and solanin as follows: 1. The precipitate of picrotoxin is more slimy, and on the addition of strong sulphuric acid becomes saffron yellow. 2. The precipitate of digitalin is gelatinous, and on treatment with sulphuric acid becomes flesh-colored or buff. 3. The precipitate of solanin is granular, and on treatment with sulphuric acid turns to a deep buff. If a little sugar is then added to the mixture, it takes, after some time, a violet color, which ultimately becomes blue.—Zeitsch. f. Anal. Chem. Chem. News; Amer. Drug., Oct. 1884, 189.

Digitalin—Color Reaction.—Mr. Lafon draws attention to a color reaction which he claims may be used to discriminate between digitalin derived from different sources. He recommends that in operating upon minute traces of digitalin the substance should be first moistened with a very minute quantity of a mixture of sulphuric acid and alcohol, then slightly heated until the appearance of a yellow tint, and lastly a drop of dilute solution of perchloride of iron added. In the case of the crystallized digitalin of Nativelle, Duquesnel, and Mialhe, the chloroformic digitalin of the codex (Homolle and Quevenne) and the amorphous digitalin of the codex, all of French origin, there is an appearance of a beautiful greenish-blue color that persists for several hours. In the case of certain foreign digitalins, notably those of German origin either crystallized or amorphous, the reaction has been always found negative. None of the alkaloids or glucosides ordinarily in use in therapeutics give a reaction that can be confounded with this. Nativelle's digitin, a non-poisonous crystalline product, free from bitterness, and insoluble in chloroform, does not give the reaction. Digitalein, which, according to Nativelle, is a complex instance, incompletely freed from digitalin, is only faintly colored. The solubilities in chloroform are given by this author as follows: 100 cc. dissolve 20 grams of Nativelle's, 16 grams of Duquesnel's, 0.16 of Merck's digitalin.—Phar. Jour. and Trans., June 27, 1885, 1068; Compt. Rend. c., 1463.

Quassin—Characters and Constitution.—Messrs. V. Oliveri and A.

Denara describe the method by which they obtained pure quassin. 30 kilos of the wood yielded 10 grams of the pure substance. It crystallizes in very slender, colorless, iridescent needles, which belong to the monoclinic system, the predominating form being the oblique prism with rhombic base. It melts at 210°–211° (Christensen 205°), and is very soluble in alcohol, chloroform, and acetic acid, but only sparingly in ether: 100 parts of water at 22° dissolve 0.2529; the aqueous solution becomes yellow on exposure to the air, is dextrorotatory, excessively bitter, and reduces Fehling's solution. The results of the analyses agree nearly with the numbers required by the formula $C_{32}H_{44}O_{10}$, and differ considerably from those given by Wiggers and by Christensen, who proposed the formulæ $C_{10}H_{12}O_5$ and $C_{31}H_{42}O_9$ respectively.

When quassin is heated at 90° for some hours with dilute sulphuric acid (4 per cent.), it yields

Quasside ($C_{32}H_{42}O_9$), a white, amorphous, bitter substance, formed from quassin by the removal of the elements of 1 mol. H_2O; no glucose could be detected in the mother-liquors. It melts at 192–194°, and when boiled with dilute alcohol is reconverted into quassin, which crystallizes out as the solution cools. Quasside is also formed when quassin is boiled with acetic anhydride, but if sodium acetate is present there is a powerful reaction, and several substances seem to be produced; these have not as yet been submitted to examination.

If quassin is heated with concentrated hydrochloric acid in sealed tubes for four hours at 100°, methyl chloride is formed, and escapes on opening the tubes; whilst the hydrochloric solution, when diluted with water, deposits first a resinous matter, which should be removed, and then, after a time, a colorless substance in small nodules. This new compound, which the authors call

Quassic Acid ($C_{14}H_{19}O_3 \cdot COOH$, or $C_{28}H_{38}O_6(COOH)_2$), is far less soluble in alcohol than quassin, and crystallizes in silky needles which melt at 245°, and reduce Fehling's solution and ammoniacal silver nitrate in the cold. It seems to be formed thus: $C_{32}H_{44}O_{10} + 2HCl = C_{28}H_{38}O_6(COOH)_2 + 2CH_3Cl$, so that quassin would be the ethereal salt of quassic acid.—Amer. Jour. Phar., Jan. 1885, 29, 30, from Jour. Chem. Soc., 1884, 1192; Gazzetta Chim. Ital., xiv., 1–9.

Arbutin, Ericolin and Urson.—Occurrence in *Rhododendron maximum*, L., which see under "Materia Medica."

Arbutin—Preparation, etc.—The observation of Lewin that arbutin—the active principle of the bearberry (*Arctostaphylos uva ursi*)—is transformed into hydroquinon in the animal economy, has directed attention to this compound. After a description of its characters, composition, etc., as determined by previous experimenters, Mr. J. Dalmon proceeds to give the method which he has employed for its preparation. The preparation, although very simple in theory, presents considerable difficulty in practice. The bearberry is especially rich in tannin (averaging 35 per cent.), and in addition contains gallic acid, urson, a resinous matter, gum, chlorophyll, pectin, besides arbutin, to which last it appears to owe the greater part of its therapeutic properties. All these principles, with the exception of urson, are soluble in boiling water.

The process given by the author for the preparation of arbutin is to treat by successive decoctions the drug reduced to a coarse powder, then to combine the products and precipitate the tannin and extractive matters with subacetate of lead. The decolorized liquid is treated with sulphydric acid and evaporated rapidly. The arbutin crystallizes upon cooling in the concentrated liquor; but in consequence of the decomposition of a certain quantity of arbutin during the operation, a sticky crystalline mass is obtained which dries only imperfectly. This complex product is called

Arbutose by the author, who says it is tolerably uniform in composition, the proportions being about 55 per cent. of crystalline arbutin, 35 per cent. of glucose and 10 per cent. of water. In order to obtain the crystalline arbutin, this arbutose is dried in the air as far as possible, treated with charcoal and then with successive quantities of alcohol and distilled water.

But the author is of opinion that, with the exception of solutions intended for hypodermic injection, for which only the crystallized arbutin should be used, arbutose may be used in all pharmaceutical preparations. In order to determine its strength it is only necessary to estimate the glucose by means of cupropotassic solution, and deduct this and the water, the remainder representing pure arbutin. Arbutin may also be administered under the form of an elixir or in pills.

Arbutin is non-poisonous, and may be given in doses of from 50 centigrams to 2 grams twice daily. Under the influence of this glucoside the urine will after the second day frequently show a green color, which is due to the presence of hydroquinon. The author has observed that on his own person large doses have a tendency to produce an eruption of the skin, a fact of which it would be necessary to take cognizance when administering arbutin to patients of herpetic temperament.—Amer. Jour. Phar., Mar. 1885, 139–141; Phar. Jour. and Trans., Feb. 14, 1885, p. 659.

Picrotoxin—Characters and Constitution.—Some years ago, Messrs. Barth and Kretschy found that when picrotoxin is repeatedly crystallized from boiling benzol and boiling water, it separates into two other substances, which they named picrotin and picrotoxinin. They regarded these two substances as being present side by side, in the commercial picrotoxin, and in fact to actually constitute this substance, the action of the benzol and water being held to be merely a mechanical separation by means of different solvents. This view was afterwards opposed by Paterno and Oglialoro, who also studied the decomposition products of picrotoxin. Recently, Professor E. Schmidt has published an elaborate paper on this subject, in which he gives at length his reasons why picrotoxin should be regarded as a positive, homogeneous individual, not composed of two or more bodies mechanically mixed, though easily decomposed chemically. Among other peculiarities of picrotoxin is its behavior toward chloroform. If finely powdered picrotoxin be shaken with chloroform at the ordinary temperature, it is more or less completely dissolved, according as more or less menstruum is used. If the solution is filtered *soon*, and set aside in a well-covered vessel, a copious separation of fine, needle-shaped crystals takes place, which are found to be picrotin, while the liquid holds in solution chiefly picrotoxinin. In fact, the picrotoxin is now split into its two decomposition products. Had the latter been originally present as a mere mixture, the chloroform would (most probably) not have dissolved both together and deposited one of them again afterwards, but it would have dissolved the picrotoxinin (which is very soluble in chloroform), while it would have left the picrotin undissolved. In addition to this peculiarity towards chloroform and benzol, Schmidt found it to be always—if carefully purified—of the uniform composition $C_{30}H_{34}O_{13}$; to have a constant melting point (199–200° C., while a mixture of the two decomposition products does not fully melt until between 210° and 230° C.), and to be always anhydrous, while picrotoxinin crystallizes with 1 molecule of water.—Amer. Drug., July 1884, 127; from Arch. d. Phar. (222) 169.

Picrotoxin—Use for the Relief of Night Sweats.—Dr. Cauldwell has used picrotoxin for the relief of phthisical night sweats, and found it to be by far the best remedy. The dose recommended by Ringer and Murell, $\frac{1}{150}$ grain, being too small, he gave $\frac{1}{40}$ to $\frac{1}{20}$ grain in one dose at bedtime, to be repeated at midnight, if necessary. Success was invariable, and there were no disagreeable results.—Amer. Jour. Phar., April 1885, 206; St. Louis Med. and Surg. Jour., Nov. 1884, N. Y. Med. Jour.

Vincetoxin—Modifications.—Ch. Tanret, in an investigation of Vincetoxicum officinale, found two modifications of vincetoxin, a glucoside of the formula $C_{16}H_{12}O_6$, one soluble, the other insoluble, in water. The coarse powder, mixed with some slaked lime, is exhausted with water, the solution saturated with chloride of sodium, the precipitate washed with salted water, dried, shaken with chloroform, decolorized with charcoal, the liquid distilled, and the residue dissolved in an equal weight of alcohol. Now add ether, for precipitation, then half of the entire volume of water, and shake. Evaporate the watery solution, which yields the soluble modification. To the ethereal solution add water rendered slightly alkaline, which separates a resinous acid; shake with diluted

H_2SO_4 neutralize, distil, and dry the residue at 100° C., when the second modification is obtained.—Amer. Jour. Phar., May 1885, 238; Rép. Pharm. Chimie, No. 3, 1885.

Daphnetin—Chemical Constitution.—H. Stünkel has shown, in 1879, that daphnetin is most likely a dioxycoumarin. Messrs. W. Will and O. Jung have now further investigated this decomposition product of daphnin. About 20 kilos of extract of mezereon are necessary for preparing about 30 grams of daphnetin, from which a number of derivatives were prepared, showing that daphnetin has the same relation to pyrogallic acid as coumarin has to phenol, umbelliferon to resorcin, and most likely æsculetin to phloroglucin.—Amer. Jour. Pharm., Mar. 1885, 145; from Berichte D. Chem. Ges., 1884, p. 1081–1091.

Santonin.—Occurrence in *Artemisia gallica*, Willd., which see under "Materia Medica."

Helenin—Characters and Uses.—A writer in "Quarterly Therapeutic Review" observes that helenin crystallizes in four-sided prisms, insoluble in water, but soluble in ether and alcohol; it has a yellow color, melts at 72°, and boils at 140° C. (284° F.); its formula is $C_{21}H_{28}O_3$. Helenin has been extensively employed in the general hospital of Madrid in the treatment of tuberculosis, chronic broncho-pneumonia, and whooping-cough. Considerable benefit has been obtained in early phthisis, and striking results in chronic bronchitis, and especially in whooping-cough. In all cases helenin diminished the attacks of cough, and relieved the dyspnœa and pains of the chest, without causing any symptoms of narcotism. The expectoration diminishes and becomes almost gelatinous. It also has a decided tonic action on the digestive organs, and improves markedly the appetite in phthisis.—Amer. Jour. Phar., Dec. 1884, 646.

Helenin—Medicinal Use.—Dr. Valenzuola has successfully treated troublesome coughs by helenin given in pill form or dissolved in alcohol. He employed it in bronchitis and phthisis, in doses of one-eighth grain in pill ten times a day, or five drops of the tincture three times a day. In every case the cough was moderated, the expectoration was lessened in quantity and became mucous, and the thoracic pains were greatly mitigated. The drug also increases the appetite and improves digestion. It is possessed of no narcotic properties. Helenin is not a new remedy, for it was known, though but little esteemed, by our fathers.—Amer. Jour. Phar., Oct. 1884, 530, from El Siglo Med.

Cathartic Acid—Isolation and Characters.—Mr. Ralph Stockman reviews the literature on senna leaves and their active constituent, and gives the result of his experiments to determine the precise characters of cathartic acid. After trying different methods for its isolation, he finally adopted the following: The fol. sennæ spiritu extracta were thoroughly moistened with very dilute sulphuric acid in order to set free the cathartic acid from its salts, and then all the matters soluble in cold or hot alcohol were extracted. The alcoholic solution was then precipitated with hot saturated solution of baryta, which was added until it no longer gave a precipitate. The whole was then filtered, the residue well washed, and having been put into a glass vessel, a stream of carbonic acid gas was passed through it for some hours. It was again filtered, and as the CO_2 does not decompose all the cathartate of baryta, the cathartic acid is found partly free in the filtrate and partly as cathartate of baryta in the residue on the filter. The latter, after treatment with sulphuric acid and filtering, yields a light brown colored filtrate, which was repeatedly shaken up with ether to remove the coloring matter arising from a slight decomposition of the cathartic acid. It was then carefully neutralized with lead carbonate or oxide at a very slightly elevated temperature, filtered, and so much alcohol and ether added to the filtrate that a moderate precipitate occurred. After again filtering, the filtrate was treated with very great excess of alcohol and ether, the resulting precipitate of cathartate of lead collected on a filter, washed with alcohol, and dried *in vacuo* over sulphuric acid. There remains in the alcohol-ether, however, a considerable quantity of cathartic acid, because the neutral cathartate of lead seems during the precipitation to form both a basic and an acid salt, the latter of which is not thrown down.

To obtain the baryta salt, the same method practically is used, barium hydrate being substituted for lead. The neutral solution, however, is only very slightly precipitated by alcohol-ether, and hence baryta water must be added to it, thus greatly facilitating the precipitation.

In the filtrate obtained after treating the original barium precipitate with CO_2 there is also a large amount of cathartic acid, which may be recovered by adding acetate of lead, treating the precipitate with sulphuric acid, filtering, and then adding to the filtrate baryta water. The resulting precipitate is then washed, and from it either the lead or barium salt obtained as before.

By this method a large quantity of the cathartic acid is undoubtedly lost, unless the various filtrates and precipitates be re-worked, but after trial of many other methods and modifications of this method, he found that by it the purest specimens of cathartic acid are obtained. The chief points in it are: (1) that the solutions of the active substance must never be evaporated by, or even exposed to heat, as thereby, whether the solution be acid, alkaline or neutral, decomposition is certain to ensue. This was proved by a series of special experiments. And (2) the use of H_2S must be avoided, as it was probably from this that the sulphur in Kubly's acid arose.

The salts have the following characteristics: Cathartate of lead is a non-crystalline, grayish powder. The neutral salt is readily soluble in water, the basic salt insoluble, or nearly so; and, on treatment with water, the former splits into an acid and basic salt. The baryta salt behaves in the same way. When in mass it is almost black in color, but when finely powdered becomes yellowish red. When quite pure, neither salt contains either *nitrogen* or *sulphur*, and hence the presence of these bodies in Kubly's carthartic acid must be attributed to impurities. If the salts be decomposed with sulphuric acid and then filtered, a clear brown solution of the free acid is obtained. The test for its purity consists in agitating it with ether, when the latter should remain quite colorless. It is almost tasteless.

By boiling carthartic acid or one of its salts for a few minutes with a dilute mineral acid, the clear solution becomes turbid and throws down a yellowish brown precipitate mixed with black flecks; these latter collect themselves into a black mass, and finally form the only decomposition product which is insoluble in water. It is the

Cathartogenic Acid of Kubly (also purgative), but contains other bodies as well. In fact, cathartic acid appears to be a colloid glucoside, which on boiling with acids is not simply decomposed into glucose and a simple body, but a whole series of intermediate products are formed, the investigation and identification of which would consume a vast amount of time.

All the purgative substances which up to the present time have been separated, either pure or as decomposition products of glucosides from rhubarb, senna and rhamnus—viz. chrysophanic acid, cathartic acid, emodin, and many other unnamed bodies—act locally as irritants, and hence as purgatives, when introduced into the alimentary canal. A colloid glucoside like cathartic acid has an especially violent action, as it is absorbed with great difficulty, and hence traverses the greater part of the intestines. Its decomposition products act in the same manner.—Amer. Jour. Phar., May 1885, 256–263; Phar. Jour. and Trans., March 1885, 740.

Jalapin—New Investigation.—Dr. Samuelson has investigated the chemical constitution of jalapin. It is represented by the formula $C_{34}H_{56}O_{16}$, being the anhydride of jalapic acid, and when boiled with baryta water it splits up into two molecules of jalapic acid, forming the barium salt. Dilute hydrochloric acid splits jalapin up into glucose and jalapinol ($C_{16}H_{30}O_3 + \frac{1}{2} H_2O$), possessing all the properties of an aldehyd. Jalapinol, when decomposed with alcoholic potash, yields jalapinolic acid ($C_{16}H_{30}O_4$), isobutyl alcohol, and a neutral resin, possibly a polymer of jalapinol. Both jalapinolic acid and jalapinol are oxidized by permanganate of potassium to isobutyric acid. From these and other considerations, jalapinol appears to be tetrabutylaldehyd.—Phar. Jour. and Trans., Nov. 1, 1884, 343; Chem. Ztg., Oct. 9, 1884, 1543.

Aloin—Yield, etc., from Different Aloes.—Mr. H. C. Plenge has prepared aloin by the process of Tilden, and found it to give good yields with Barbadoes, Cape, Curaçoa and Bonaire aloes, but not with Socotrine aloes. The process, as carried out by the author, was as follows: 25 grams of aloes were dissolved in 250 cc. of boiling water acidulated with hydrochloric acid and allowed to cool. The liquid was then decanted from the precipitated resinous matter, evaporated to about 50 cc., and set aside two weeks for crystals to form. The liquid portion was poured off, the crystals were pressed between folds of bibulous paper to remove as much as possible of the adhering resin, and then purification by various means was tried.

The mixture of crystals and resin was dissolved in diluted alcohol, the solution filtered and set aside to crystallize. The crystals were still contaminated with a considerable amount of resinous matter. Other solvents were used, of which acetic ether proved to be the best. The resin is apparently more soluble in ether than the aloin, and when the impure aloin was treated with this solvent and allowed to stand, with occasional agitation, the liquid acquired a brown color, and the yellowish color of the crystals could be distinguished. The liquid was then quickly and carefully poured off, and the crystals dried.

In the first experiment Socotrine yielded 3 per cent. of aloin: in subsequent trials none was obtained. Barbadoes aloes, to which this process is specially adapted, averaged 9 per cent; Curaçao averaged 7.5 per cent., and Bonaire 7 per cent.

Aloin was obtained from Socotrine aloes by the following process: One part of Socotrine aloes was digested in 3 parts of alcohol for 24 hours, then transferred to a water-bath and boiled for about two hours. After cooling, the liquid was poured off from the resin, filtered, placed in an open dish, loosely covered, and set aside to crystallize. The crystals were then washed with a little alcohol and dried. The yield was about 10 per cent.—Amer. Jour. Phar., Oct. 1884, 507–508.

Opionin—A New Principle from Smyrna Opium.—Dr. O. Hesse gives preliminary notice under the name of "opionin," of a body which he says he has frequently observed in Smyrna opium, though occurring only in small quantity. It is obtained by treating the solution resulting from the action of excess of milk of lime on opium with a slight excess of acetic acid, concentrating, and extracting the brown flocks that form with ammonia; the opionin separates from the clear filtrate upon the addition of hydrochloric or acetic acid. After purification it forms concentrically grouped small colorless needles, melting with a brown coloration at 227° C. It is freely soluble in alcohol and in ether, but almost insoluble in boiling water. It is without action upon litmus, and appears to contain no nitrogen.—Phar. Jour. and Trans., May 30, 1885, 986; Annal. d. Chem., ccxxviii, 299.

A New Glucoside has been isolated from the leaves of *Boldoa Fragrans*, which see under "Materia Medica."

Shikimipikrin.—A new bitter principle from the fruit of *Illicium religiosum*, which see under "Materia Medica."

Condurangin.—A new glucoside resembling vincetoxin. See *Gonolobus Condurango* under "Materia Medica."

Scopolin.—A new glucoside from *Japanese Belladonna Root*, which see under "Materia Medica."

Pinckneyin.—A new glucoside from *Pinckneya pubens*, Mich., which see under "Materia Medica."

Picrocrocin (Saffron bitter), a glucoside from *Crocus electus*, Gatinais, which see under "Materia Medica."

COLORING MATTERS.

Chlorophyll—Cause of Change in Color.—Mr. A. Tschirch has found, during his researches on chlorophyll, that the want of permanency in color of the solutions of that body is due in alcoholic extracts to the vegetable acids extracted along with the chlorophyll, which at once causes its transformation into chlorophyllan. The color is best preserved in an alkaline extract, when chlorophyllan is not formed, but the chlorophyllinic acid unites with the alkali to form a permanent green salt with a dark red fluorescence. The want of permanency of the green color in dried leaves is attributed to the destruction of the protoplasmic envelope which served to protect it in the living plant. In some cases bright yellow, red, or dull brown pigments are formed by the action of weak acids in the leaves or chlorophyll; or by oxidation of the tannic acid contained in these leaves. In all cases of the development of autumnal tints it appears to be due to the triumph of chemical forces over the weakened or destroyed vitality of the living plant.—Phar. Jour. and Trans., Dec. 1884, 503.

Chlorophyll—Use as a Coloring Agent.—Dr. A. Tschirch, in continuation of his paper on the chemical characters of chlorophyll (see Proceedings 1884, 334), proposes the following methods of obtaining a solution of chlorophyll suited for imparting a magnificent green color to liqueurs, candies, etc.

Green leaves, as free from tannin as possible (grass is the best) are extracted with boiling alcohol and the filtrate evaporated to dryness; the residue is repeatedly extracted with water, until this remains colorless, and is then dissolved in cold alcohol. The solution is evaporated at a gentle heat, so that crystals may form. The crystals are again dissolved in alcohol, powdered zinc is added, and the mixture heated on a water-bath so that the chlorophyllan may be reduced to chlorophyll. The magnificent emerald-green solution, having a handsome red fluorescence, is very permanent, and may be preserved for a long time in diffused daylight. In direct sun-light it is decomposed as rapidly as are the anilin colors. It may be used in form of this solution as a coloring agent; or it may be evaporated, and the residue dissolved in fixed oils, bisulphide of carbon, benzin, or ether, according to the use to which it is to be applied.—Pharm. Rundschau, August 1884, 177.

Green Color for Ointments and Oils—Process.—Sicha recommends an alcoholic extract of turmeric (one part representing ten parts of the root), which is rubbed smooth with a little alcohol, and mixed with the liquefied fat. When about half cooled down, add sufficient of a solution of blue carmine (indigo carmine) till the desired shade has been obtained.—Amer. Jour. Phar., Jan. 1885, 27; from Leitm. Rundschau, ix. 2.

Indigo—Reliable Method of Assay.—The determination of indigotin in indigo presents various difficulties, and the processes in use are long, and subject to considerable error. Mr. Charles Tennant Lee has for several years used a method by sublimation which has been uniformly satisfactory. Indigo sublimes readily, and, by a careful regulation of temperature, can be separated from the components of indigo: indigo brown, indigo red, mucilaginous matter, etc. The operation is best effected in a shallow platinum tray. Those in use are 7 cm. long, 2 cm. wide, 3 to 4 mm. deep. Into such a tray is weighed about 0.25 gm. of finely powdered indigo which has been dried at 100° C. The weighing should be rapid to avoid absorption of moisture, and it is best not to exceed this amount greatly for a tray of the size noted, in order that the layer of indigo may be thin. Spread the weighed powder evenly over the tray by tapping it with the finger; this can be done easily if the bottom of the tray is quite flat, with no rounding toward the sides. Sublime on an iron plate, at first raising the heat gradually to avoid burning. When the surface of the indigo is covered over with a shining layer of crystals, turn down upon the plate a piece of Russia iron, bent into the form of a flat arch, the highest point of which is about 1 cm. above the plate, and a little longer than the tray. Lower the heat at the same time that the arch is put on, as the temperature rises rapidly. The purple vapors of indigotin are now given off, a portion condensing upon the under sides of the arch. Raise the heat slowly, and enough to maintain a constant sublimation of indigotin. By raising the arch the progress of the work is seen. For a five per cent. indigo the time required is thirty to forty minutes; but soft Java indigo must be sublimed with more caution, and sometimes requires two hours. The last crystals of indigotin are easily seen upon the dark-colored surface of the residue. When all have disappeared, remove the tray, cool in a desiccator, and weigh. The loss in weight is indigotin. Observe that the heat be no greater than is required to sublime the indigo blue, and that no yellowish vapors appear, which would indicate the destruction of the residue, leaving only ash. If the bottom of the tray is flat, and everywhere touches the plate, the sublimation goes on regularly, except in case of very rich indigos, already mentioned, when care must be exercised to prevent burning. Results by this method are constant within one-quarter of one per cent., but the author has frequently made re-determinations with variations of only half that error. A little practice enables one to leave the sublimation with only occasional attention, and three or four determinations may be carried on at once under the same arched cover. For commercial and industrial purposes, this method appears to have decided advantages. Its rapidity is in great contrast with the other methods, which admit of perhaps two determinations in a day, while in point of accuracy it is not wanting.—Amer. Drug., Nov. 1884, 217, from Jour. Am. Chem. Soc., vi., 185.

Indigo—Decolorizing Action of Ferric Salts.—Mr. L. Margary, in experimenting on certain iron mordants for silk containing ferric sulphate and nitric acid, found it necessary to determine the amount of nitric acid present. This was done by means of indigo solution, and the author observed that the results were invariably too high. This he attributed to the oxidizing action of the ferric salt, and found on heating the indigo solution with pure ferric sulphate that it was rapidly and completely decolorized. the ferric being reduced to a ferrous salt.—Amer. Jour. Phar., Sept. 1884, 482; Gazz. Chim. Ital. (13), 374-375.

Sulphindigotic Acid.—Use as an indicator in *Alkalimetry*, which see under "Inorganic Chemistry."

Lakmoid—A New Indicator.—A compound resulting from the action of nitrite of sodium on resorcinol is described by Messrs. Traube and Hock, under the name of "lakmoid," as an indicator resembling litmus in many respects, but of extreme delicacy.—Arch. d. Phar., xxiii., 27.

The sensitiveness of lakmoid is confirmed by Mr. H. N. Draper, who says that the reddish solution was turned distinctly blue by water containing 0.39 grain per gallon of carbonate of calcium, with which carefully prepared neutral litmus or hæmatoxylin solution failed to give the least indication of alkalinity. The reaction is, however, masked in the presence of carbonic acid under a pressure of three or four atmospheres, though this acid does not interfere under ordinary conditions. Carminic acid is also found to be a delicate reagent, under precisely the same restrictions. —Chem. News, May 1, 1885, 207; Phar. Jour. and Trans., May 30, 1885, 987.

Blue Coloring Matter, from *Crescentia Cujete*, which see under "Materia Medica."

Crocine.—The coloring matter of *saffron* (*Crocus electus*, Gatinais, which see under "Materia Medica."

ALBUMINOIDS.

Pure Egg Albumen—Preparation.—According to Ruckert, pure egg albumen may be obtained by adding an equal volume of carbonated water to an aqueous solution of albumen deprived of the membranes by beating. The copious flocculent precipitate is filtered off, and the filtrate dried at 40° C.—Amer. Drug., Feb. 1885, 35; from Chem. Zeitg.

Albumen—Comparative Value of the Old and New Tests for its Presence in Urine.—In a paper on the above subject in the recently published Manchester Medical Chronicle, Dr. William Roberts, referring to the fact that the urine in health contains various forms of albuminoid matter, expresses his belief that the new tests for albumen, which have recently been brought into prominence, especially picric acid, tungstate of soda, potassio-mercuric iodide, and the acidulated brine-test, "produce frequently in the urines of perfectly healthy persons a reaction which is undistinguishable from the reaction which indicates disease or abnormality." This point was put to the proof by the examination of the urine of thirty-one healthy persons—students, candidates for insurance, and others—who exhibited no signs of disordered health, and in whose urine heat and nitric acid gave no indication of albumen.

Mr. George Johnson replies to the above, and maintains that so far as picric acid is concerned, it is certainly far superior to any other. The main advantages of picric acid as a test for albumen, are the following:—It instantly detects a small amount of albumen which nitric acid would indicate only slowly or not at all; while, on the one hand, an insufficient addition of the test does not, as is the case with nitric acid, prevent the subsequent coagulation by heat; neither, on the other hand, does an excess of picric acid redissolve the precipitate, as does an excess of nitric acid. For bedside urinary testing, the portability of the innocuous powder is a great convenience. The fact that, with caustic potash, it is an infallible qualitative and quantitative test for sugar, may be said to more than double its value as an urinary test. The picric acid which is used for sugar-testing should be purified by recrystallization. The commercial samples usually give a red color when boiled with liquor potassæ; and he lately saw an impure sample which not only gave this red color, but the liquid was rendered turbid by fine granules. The impurity was removed by solution and recrystallization. A simple test of the purity of picric acid for chemical purposes is to boil a mixture of one volume of the saturated solution with half its volume of liquor potassæ. The resulting liquid should be quite pellucid, and of a pale lemon-yellow color, with no red tinge. The author admits that there are some objections to the other tests mentioned, but mentions that these, with proper precautions and conditions, are likewise available. The difference between them and the picric acid test for albumen is this—that the picric acid, unmixed with other reagents, while it is a most sensitive and trustworthy test for albumen, gives no reaction with mucin. On the other hand, the potassio-mercuric iodide, tungstate of sodium, and brine, do not precipitate albumen, unless when combined with an acid; and this combination gives a reaction with mucin, which is not distinguishable from a minute trace of albumen.—Amer. Jour. Phar., Dec. 1884, 636–640; from Phar. Jour. and Trans., Oct. 1884, 329.

Yeast.—Destruction of vitality by *Salicylic Acid*, which see.

A New Alcoholic Ferment—Accidental Discovery.—At Busalla, in the north of Italy, there is a small brewery which has gained a considerable reputation for its beer brewed on the low fermentation system. Last season these beers were very inferior, and without any apparent reason. A local chemist, Mr. Mendes, was called to investigate the matter, and the result of his researches was the discovery of what is believed to be a new form of ferment. Among the cells of ordinary *Saccharomyces cerevisiæ* were some of *Saccharomyces Pastorianus*, and some other cells very much smaller in size. These latter were isolated and cultivated by themselves, and were then found to be almost spherical in shape, and from $\frac{1}{300}$ to $\frac{1}{500}$ of a millimeter in diameter. The shape, size, and general appearance of the cells of this ferment were found to be very constant, and they very closely resembled those represented on the right hand of Plate III. in Pasteur's "Etudes de la Bière." So far there would be nothing very remarkable in the identification of a new form of ferment, but M. Mendes, by some carefully conducted experiments, has proved that this ferment is altogether without action on cane-sugar. It is generally admitted that ordinary yeast is not capable of directly fermenting cane-sugar, but that it first exerts an inversive action on cane-sugar, and, after this inversion, fermentation takes place. Now the peculiarity of the new ferment discovered by M. Mendes is not that it will not ferment cane-sugar, but that it will not invert it. Experiments were made with this new ferment on impure cane-sugar solutions, and the result was said to be that the glucose and invert-sugar was fermented by it, but the cane-sugar was left untouched. The practical importance of this discovery to sugar-refiners must, therefore, be very great, and it is at the same time of very considerable interest to brewers. We propose to refer to it in greater detail on a future occasion.—Amer. Drug., Feb. 1885, 36; from Scient. Amer.

Pepsin—Assay of Commercial Samples.—Mr. Charles Everett Coombs, having prepared some samples of pepsin by Scheffer's process (saccharated), by the modification of the same, and by Jensen's process (scale), subjected them, along with a number of commercial samples, to the pharmaceutical test. As the pharmacopœia gives no directions for the division of the egg-albumen, the author adopted the following method in each case: Fresh eggs were dropped into boiling water and allowed to remain ten minutes; they were then removed, cooled, and the whites freed from the shells, membrane, and yolks. The whites were then ground together thoroughly in a mortar, and pressed through a sieve of twenty meshes to the linear inch. This egg-albumen was prepared fresh for each experiment.

For convenience and easy comparison, the author divided his samples into three classes:

1. The saccharated pepsins.
2. The scale and stronger pepsins.
3. The digestive compounds of pepsin.

The testing of the samples was carried on in a specially constructed apparatus, being a water-bath with false bottom of wire-netting, upon which the test vials (6 oz. wide-mouths) rested. Each was closed with a cap of white wrapping paper, held in place by a rubber band. Into each bottle, properly labeled, were weighed, first, 507 grains of acidulated water, and to this was added 1 grain of saccharated pepsin. Next, 75 grains of prepared egg-albumen were added, the bottles covered, placed in the water-bath, and kept at 38°–40° C. (100°–104° F.) for six hours, being shaken at intervals of twenty minutes. The contents of each bottle were then transferred to a close strainer, and the undigested albumen in each case was thoroughly washed, drained, and all of the liquid pressed out until the albumen was as near its original condition as it was possible to get it. The difference in weight (that is, the loss it had undergone) was taken as the amount digested by the sample.

1 *grain* each of the following fifteen samples of *saccharated pepsins*, made to act during six hours upon 75 grains of egg-albumen, digested the stated number of grains:

No.	Grains.	No.	Grains.
1	75	8	65
2	72	9	62
3	71	10	57
4	71	11	54
5	71	12	54
6	68	13	46
7	66	14	43
		15	None.

There was a great difference in the action of these samples; some of them began to act in a few minutes, while others were slower. Two samples, in particular, displayed but slight digestive power till the last two hours, and then were very active, so that their final result compared favorably with the others.

Two samples of No. 4 (of the same manufacturer) were tested at the same time. One was seven years old, while the other was comparatively fresh, yet their digestive power varied only 3 grains.

The author next took up the samples of scale and stronger pepsins. And here he obtained results which induce him to discredit the claims made by the manufacturers that their products would digest from 200 to 1,000 grains respectively, of egg-albumen.

He prepared a saccharated pepsin, by triturating 1 part of the stronger pepsin with three parts of sugar of milk, and 1 grain of this digested 71 grains of egg-albumen. Yet 1 grain of the stronger pepsin itself, which should have been supposed to have four times the strength of the trituration prepared from it, and therefore should have digested 284 grains, only digested 104 grains of albumen.

The author found that *the finer the powder the more active is the pepsin.* Samples 1 and 5 in the following list were of the same make, and from the same lot No. 1 was in very fine powder, and 1 grain digested 142 grains of albumen, while No. 5, being in coarse powder, only digested 108 grains.

The test was made as follows: 1 grain of pepsin was mixed with 1,000 grains of acidulated water, and 500 grains of prepared egg-albumen added to it. The larger amount of water was taken in order to cover the albumen. The manipulation was the same as before. After six hours, however, but slight action was displayed by any of the samples. A new series was then prepared, in which only 507 grains of acidulated water and 200 grains of albumen were used, and this time the results were better.

One grain each of the following 12 samples of *scale and stronger pepsins*, made to act during six hours on 200 grains of albumen, digested:

No.	Grains.	No.	Grains.
1.	142	7.	107
2.	130	8.	107
3.	120	9.	104
4.	116	10.	102
5.	108	11.	97
6.	108	12.	86

The digestive compounds of pepsin also examined by the author, which comprise pills and solutions of pepsin, may be omitted here, as the amount claimed by the makers to be present is not always indicated.

A wine of pepsin made from sample No. 1 of the saccharated pepsins above enumerated, and made by the following formula, was found, contrary to expectation, remarkably active.

Saccharated Pepsin	256 grains.
Distilled Water	2 fl. oz.
Hydrochloric Acid	24 min.
Glycerin	1 fl. oz.
Sherry Wine, enough to make	16 fl. oz.

One fl. drachm of this was mixed with 507 grains of acidulated water and 100 grains of prepared albumen. After six hours it had digested 73 grains of the latter.

Of 40 samples of pepsin and their preparation, which the author examined, 4 were devoid of peptic action altogether ; and of the saccharated pepsins claiming to be "pharmacopœial," 80% answered to the officinal requirements.—Amer. Drug., June 1885, 103–104.

Pepsin Preparations—Method of Assay.—Dr. Stutzer, in making an assay of several dry pepsins of the market, caused them to act, under identical circumstances, upon equal quantities of albumen-nitrogen (*i. e.*, albumen in which the nitrogen had been determined). He then determined the albumen-nitrogen unacted upon, and from these data calculated the activity of the pepsin. The albumen had been dried at 40° C., contained 12.45% of nitrogen, and was found to be completely soluble in freshly prepared pepsin.

The different samples of pepsin were dissolved by pouring ½ litre of water on 5 grammes of each, in a litre-flask, warming for half an hour to 40° C., then filling up to the litre mark, and finally filtering.

Two gm. of dry albumen were then placed in a beaker, 100 cc. of the pepsin solution added, together with 2 cc. of hydrochloric acid containing 10% of HCl, and the mixture heated during 6 hours on a water-bath at a constant temperature of exactly 40° C. During the heating, 1 cc. of the above acid was added every half hour, until 10 cc. had been altogether added. The contents of the beaker were now washed into a flask of the capacity of 200 cc., quickly cooled, and made up with water to the mark. The liquor was passed through a folded filter, and 25 cc. of it evaporated to dryness upon previously washed and ignited sand in a capsule made of tin-foil. The capsule and contents were then cut up, mixed with a little oxalic acid, and the nitrogen determined in the usual manner by soda-lime. Since the pepsin preparations themselves contain a little nitrogen, this was separately determined in each sample, and the amount found deducted from the total quantity. The following table contains the mean analytical results :

(See explanation of columns below.)

Number of the sample.	*a.* Gm.	*b.* Gm.	*c.* Gm.	*d.* Gm.	*e.* %	*f.* Gm.	*g.* Gm.	
1. "M." . . .	0.00915	0.249	0.06468	0.05553	62.3	0.11106	0.69	of albumen.
2. "S." . . .	0.00705	0.249	0.14660	0.13955	56.0	0.27910	1.74	
3. "W." . . .	0.00625	0.249	0.14445	0.13820	55.4	0.27640	1.72	
4. M	0.00990	0.249	0.03857	0.02827	11.5	0.05734	0.35	
5. F.	0.00710	0.249	0.13502	0.12792	51.3	0.25584	1.60	

Explanation of Columns.

a. 100 cc. of the pepsin solution contain the stated quantity of nitrogen.

b. 2 gm. of the egg-albumen employed contain . . . nitrogen.

c. After the action of the pepsin upon the albumen, the 200 cc. of liquid contain . . . nitrogen.

d. Deducting the pepsin-nitrogen (in *a*), there remain . . . nitrogen.

e. The pepsin dissolves . . . per cent. of the albumen.

f. 1 gm. each of the pepsins dissolved albumen corresponding to . . . nitrogen.

g. Assuming that pure, dry albumen contains, on an average, 16% of nitrogen, the amount of nitrogen given under *f* corresponds to . . . albumen.

—Amer. Drug., May 1885, 84, from Rep. d. Anal. Chem., 1885, 89.

Pepsin—Determination of Value.—O. Schlickum recommends for this purpose the conversion of albumen into peptone. An egg is placed in boiling water for five minutes and rapidly cooled by cold water; the albumen will be hard, the yolk semi-liquid. Cut the albumen into very fine pieces, and rub through a fine sieve; of this albumen put 10 gm. into a solution of 0.1 pepsin in 150 water, add 2.5 HCl, and keep the mixture at a temperature of 40° C., by means of a water-bath. On being dissolved, the albumen is transformed first into hemialbumose, and after ward into peptone. Digest for 12 hours, then filter, and to 10 cc. of the filtrate add, drop by drop, 1 cc. HNO_3, which should not cause more than a slight opalescence.—Amer. Jour. Phar., May 1885, 237; Ph. Ztg., No. 16, 1885.

Pepsin.—Proper method of preparing an *Elixir*, which see under "Pharmacy."

Papayotin.—Dr. W. Fliess communicates the following *résumé* respecting papayotin and its character, which may properly find place here. Papayotin is the active principle of the juice of the melon-tree (*Carica Papaya*, L.), native of the tropical zones, and flourishing especially in Brazil, where it only requires about 6 months to grow to a man's height, and to furnish fruit which ultimately attain a weight up to 15 pounds.

After three years, when the tree is about 18 feet high and about a foot in diameter, it begins to die off, from above downwards. Up to this period, however, it is very fruitful, there being no period of the year when it does not bear either flower or fruit.

The wood contains an abundance of yellow, rather bitter, milky juice, which possesses in a high degree the property of digesting albumen and therefore also meat, similar to gastric juice. It has, moreover the remarkable property of not confining its digestive action to acid solutions —as is the case with pepsin—but is equally active in neutral or alkaline solutions.

The French chemist, Wurtz, in conjunction with Bouchut, first extracted the digestive ferment, *papayotin*, or *papaïn*, in 1880. Bouchut employed it in the Child's Hospital in cases of dyspepsia and other disturbances of the digestive organs, for which pepsin had previously been used, and obtained the best results. Rossbach found that the substance was capable of rapidly dissolving and removing the membranes forming in croup or diphtheria, and thereby greatly contributing to a favorable termination of the diseases. It is assumed that, by the "digestion" of the diphtheritic membranes and the morbid elements probably existing in them, the further introduction of the latter into the blood is prevented. But it will require further study to fully clear up its method of action and its value as a remedy in these diseases (it is applied by brushing over the diphtheritic spots a solution of the substance). It is, however, important that only a reliable preparation be used, since there are some in the market which are quite inert.—Amer. Drug., Nov. 1884, 205; from Phar. Ztg.

Amylase—Occurrence.—Mr. L. Brasse, in making some investigations as to the physiological function performed by amylase, has found that this principle is always present in the leaves of the plants which he has examined, viz., potato, dahlia, topinambour, maize, beet, tobacco, *Papaver somniferum*, red poppy, and sunflower. The amylase is obtained by digesting the bruised leaves for twenty-four hours in cold water. The juice is then expressed, and one and a half times its volume of 90° to 93° alcohol is added, and the liquid filtered; after filtration the same quantity of alcohol is added, and the liquid set aside to deposit. The precipitate is filtered off and washed with a small quantity of 65° alcohol. The amylase, when present, is contained in this precipitate, and its presence is proved by its action in converting starch into, or reducing, sugar and dextrine.—Compt. Rend., xcix., 878; Phar. Jour. and Trans., Dec. 27, 1884, 503.

Peptonization—New Method.—An observation communicated to the Academy of Sciences by Mr. Marcano, of Caracas, Venezuela, is suggestive of what may prove to be a preferable process to that ordinarily employed for peptonization. Mr. Marcano has found that if a small quantity of the fresh sap from certain plants, the agave for example, be added to chopped meat just covered with water, and the mixture be kept at a temperature of 35° to 40° C., an active fermentation is immediately set up, with the evolution of inodorous gases. At the end of thirty-six hours the fibrin has disappeared, and a liquid is left containing peptone, equalling in weight, when dried in a stove, one-fifth of the fresh meat used. This fermentation appears to the author to be due to the vital action of micro-organisms, and to resemble the peptonization of the gluten of flour in bread-making. In confirmation of this view, he states that if the plant juice be saturated with chloroform the fermentation is not set up; moreover, he has cultivated, by sowing a few drops of agave sap in sugared water, a fine "*mucorinée*," which is capable of completely dissolving fibrin in the presence of water. This property is said to be by no means peculiar to agave sap, but to belong to a large number of other saps and fruit juices. Papaw juice, notwithstanding the "pepsin" it contains, is said to be relatively weak compared to the peptonizing activity of other juices from which it is impossible to extract any similar digestive principle, as, for instance, the juice of the sugar cane. He states that the crude peptone obtained by this process gives, upon analysis, an average of 10 per cent. of nitrogen, while the mineral salts do not exceed 1.4 per cent.; also that in its reactions it corresponds with very pure peptone, giving not the the slightest precipitate with ferrocyanide of potassium and acetic acid.—Phar. Jour. and Trans., Nov. 29, 1884, 422; Compt. Rend., xcix., 811.

Peptonization—Effect of Peroxide of Hydrogen.—Mr. Chandelon has studied the effect of peroxide upon albumen, and found that while the peroxide of hydrogen does not undergo any change, the albumen is in the course of time peptonized. The conclusions at which he arrives are thus briefly summarized: Peroxide of hydrogen in the nascent condition peptonizes egg-albumen, and peptonization may be considered a phenomenon of hydration, an opinion that is supported by the formation of peptone from albumen by reagents capable of fusing water, such as dilute acids, alkalies, etc., and its reconversion into albumen by dehydrating material like acetic anhydride. It is suggested that the albumen (anhydride) gives up an atom of oxygen to the peroxide of hydrogen similarly as oxide of silver does, and that the two groups that had been united by the oxygen, then combine with two hydroxyls. The conversion takes place by the same process as in digestion with peptic ferments. Thus the stages, with (*a*) pepsine, acting in acidulation, are dyspeptone, syntonine, propeptone, peptone; with (*b*) trypsine in alkaline solution, they are dyspeptone, globuline, propeptone, peptone; with (*c*) peroxide of hydrogen produced by electrolysis in acid solution, the stages are the same as with pepsine in acid solution; whilst with (*d*) peroxide of hydrogen produced by peroxide of barium, crabonic acid, and water in neutral or alkaline solution, they are dyspeptone, proteine, propeptone, peptone. It will be seen that any difference occurs in the first stage, and appears to be dependent rather on the acid or alkaline character of the medium than on the reaction itself. The author therefore puts forward the hypothesis that the digestive ferments promote digestion by the production of peroxide of hydrogen.—Ber. d. Deut. Chem. Ges., xvii., 2143; Phar. Jour. and Trans., Nov. 1, 1884, 341.

Gelatin—Variation as Obtained by Different Methods.—H. Weiske has prepared gelatin in various ways, and has found that the products differ in properties. Pieces of bone were treated repeatedly and for a long time with dilute hydrochloric acid, to remove the inorganic matter as completely as possible; they were then washed. Gelatin made from this is not precipitated from its solutions by tannic acid unless a few drops of a solution of a salt (sodium chloride, etc.) are added simultaneously ; in other respects it does not differ from ordinary gelatin. By boiling bones free from mineral matter with repeated quantities of water, and then dissolving the residue by heating with water under pressure, two solutions are obtained which, when evaporated to dryness at 100°, yield two kinds of gelatin differing from one another and also from the above variety in various properties.—Amer. Jour. Phar., Sept. 1885, 480 ; from Bieder. Centr.

Keratine—A New Pill-Coating Material.—At the Medical Congress held in Berlin, Dr. Unna described a pill-coating material which has been devised by him with the object of protecting pills from the action of the gastric juice, and yet allowing them to dissolve in the alkaline contents of the small intestine. The preparation being made from horn, has been named "keratine." The horn shavings are digested in artificial gastric juice until all the albuminous substances capable of being dissolved out by pepsin and hydrochloric acid are removed, and then for several weeks in ammonia. The keratine is dissolved by the ammonia, and upon evaporation of the solution until only a trace of ammonia remains, a gum-like liquid is obtained, which can be used for coating pills. Dr. Unna has found that pills made with ordinary excipients are apt to swell and burst the keratine coating, and he recommends the use of an excipient consisting of charcoal, almond oil, and cacao butter. Each pill should be covered with a layer of cacao butter, and then coated two or three times with keratine. Although not soluble in hydrochloric acid, keratine is soluble to some extent in acetic and citric acids, which acids should therefore not be given at the same time as keratine-coated pills.—Phar. Jour. and Trans., Nov. 29, 1884, 422.

REPORTS OF COMMITTEES.

REPORT OF THE COMMITTEE ON THE DRUG MARKET.

BY M. N. KLINE, PHILADELPHIA.

The drug trade has been far from satisfactory during the past year. This is of course in part due to the general stagnation of business prevailing in this country as well as throughout the whole world. But there are other and special causes for the unsatisfactory condition of this branch of trade, which it may be well to refer to in connection with this report.

The chief cause, in our opinion, for this unprofitable condition of the retail drug business, is the excessive number of stores as compared with our population. From a recent article published in the "Chemeker Zeitung" (May 20th, 1885) we learn that the proportion of Pharmacies to the population in Germany averages about one to each 11,445, while in this country the proportion is about one to 2,000. It is scarcely a matter of surprise therefore to find that notwithstanding our drug stores, as a rule, offer a very much more heterogeneous stock than those of the country above referred to, they still rarely yield the owner more than a frugal existence.

Another reason why the drug business is unprofitable is the increasing sale of ready packeted medicines. These can usually be handled by the grocer and the dry-goods dealer as well as by the educated druggist, and at a very much smaller margin of profit.

It would doubtless be a matter of surprise to many of you if we could furnish statistics showing the proportion of ready-made articles retail druggists are obliged to handle in addition to the regular and ordinary patent medicines. Physicians are more largely responsible for this state of affairs than is generally supposed. While loudly condemning nostrums, in their individual and collective capacity, many daily prescribe Bromidia, Iodia, Listerine, and hundreds of similar preparations—insist upon Jones' Elixir because they like the taste better than those made by Brown—one specifies A. & B.'s Pills, because they are round and not oval, while another prefers B. & C.'s because they are oval and not round—must have a certain brand of pepsin, because it is patented and advertised, and the maker announces that he has secured an injunction against some one else who was willing to supply a suffering world with an equally meritorious article, at a price more nearly representing its intrinsic value—and so on *ad infinitum, ad nauseam.*

The Pharmacist is not entirely blameless for reducing his calling more and more to that of a mere shop-keeper. A policy that builds up dozens of mammoth establishments in this country who thrive by putting up ready-made Cough Remedies, Liver Cures, Blood Purifiers, and what not? "with your name printed neatly on each wrapper," cannot tend to ameliorate the state of affairs the drug trade is suffering from. Legislation restricting the business to those who are properly qualified is sorely needed in each State, and is a step in the proper direction; but a more general effort to cast off the shackles that are fastened upon the trade is equally urgent. The "out-puts" (if we may be allowed the expression in this connection) of our medical colleges, as well as our colleges of pharmacy, are generally largely in excess of the demand, and a good way to "restrict" this over-supply would be to establish more rigid courses of instruction, and graduate only such as show a thorough fitness to merit a position in the profession.

In spite, however, of the season of unremunerative business which the drug trade has passed through, the failures during the year in both wholesale and retail branches have been comparatively few. This we believe is entirely due to economic and frugal management, habits the result of training in the school of necessity. As we write, the crop reports from the South and West are very encouraging, and general business is showing decided evidences of improvement, in which the drug trade will doubtless share.

Reference to the table of package prices of the leading articles for each month during the year, furnished herewith, shows a general shrinkage in values. The exceptions are mostly articles which have been advanced by artificial means, viz: by combination on the part of producers or manufacturers. The most notable of these are iodine and salts, bromine and salts, and bismuth and preparations. Quinine has reached unprecedentedly low figures during the year, full reference to which will be found under the proper heading in our review.

No apparent progress has been made in the direction of obtaining relief from the onerous and unnecessary internal tax upon alcohol, and much blame, we think, attaches to the members of the drug trade for their lack of personal interest in this subject. Politicians, who are largely our law-makers, will not move in this matter if their constituents will not insist upon some attention to their reasonable demands.

Much of the value of this drug market report is entirely lost by reason of its not reaching the members for months after it is written. The facts and figures accompanying these reports, and which are collected at great sacrifice of time and labor, lose much of their practical value by this delay. We recommend, therefore, to the Association, that if this feature of the proceedings is to be continued at all, the Secretary be requested to issue the report in circular form to the members as early after the meeting as practicable. This would enable members to take advantage of the information given, and also act as a stimulus to the author of the reports to make them more comprehensive.

The table of imports covers receipts at the port of New York only, as we were unable to obtain figures for the entire country.

The Committee take pleasure in acknowledging their indebtedness for valuable information furnished by Mr. A. H. Jones, with Powers & Weightman, the *Oil, Paint and Drug Reporter*, Messrs. Chas. Pfizer & Co., and Messrs. Dodge & Olcott. They also beg to call attention to the very interesting and valuable chart showing the movements of cinchona bark and quinine during the last fifteen years, furnished your Committee by Mr. Alexander Bohringer, connected with the New York Quinine and Chemical Works.

Respectfully submitted, M. N. Kline,
Chairman.

Alcohol shows but little change over prices ruling during the previous year. It is worth noticing that while our pharmacists pay from $2.10 to $2.20 per gallon for this indispensible solvent, the foreigner can supply himself here at about 30 cents per gallon.

Earnest, united and continued protest should be made by druggists until this discrimination in our internal taxes is modified, or, still better, entirely removed.

Ammonia, Carb. The price of this article has ruled at the lowest point it has ever touched, say 11 to 11½ cents for the best American in barrels, and actual weight, against the average of over 50 per cent. greater value for the English in casks at invoice tare, for many years before this article was produced here. How much longer this competition will continue remains to be seen; but the American manufacturers, with the preference their article deservedly enjoys, and with the protection of 20 per cent. duty, freight, etc., are not likely to abandon the field, and in fact the production in this country this year has been increased by the output of a new make in Detroit.

Bismuth shows a heavy advance during the past year. Subnitrate, which was quoted at $1.25 per pound in bulk at the opening of 1885, was advanced January 19th to $1.90, and February 3d, to $2.00, at which it is quoted at the close of our report. Bismuth for several years ruled steadily at about 6s. 8d. per pound. Early in 1884 some Australian was offered at 5s. This resulted in the combination lowering their price to 4s. 6d. (from 6s. 8d.) and threatening to go still lower so as to crush out the Australian competition. A very limited amount sold as low as 2s. 6d. for Bolivian. The above, say in April and May, 1884. On January 17, 1885, 7s. 6d. was fixed for Saxon, Bolivian and Australian, and this explains advance noted above in subnitrate.

Borax has been steadily depressed in price by over-production largely in excess of consumptive requirements. The producers in California and Nevada have from year to year crowded the home and foreign markets, and never been able to agree on a wiser policy of curtailing the outputs. The situation has been rendered still worse by successive large declines in Europe, where the value of the article has reached so low a point as to practically exclude further importations from the United States. In fact, the price of the article both here and abroad is now so low that only the richer and better-situated mines on the Pacific Coast can exist, while the poorer deposits could only work at a loss, and have consequently mostly suspended operations for the present. This is only a repetition of former experiences, which however have failed to impress their lesson on the parties concerned. New commercial uses have recently been found for the article, one of which is in the packing of meats for which it is now said to be employed in Chicago. The extension of the iron industry will also increase consumption. The demand from abroad is principally for soap making, notwithstanding the supplies from Italy. Referring to our list of imports, it is necessary to explain that while 61,787 pounds were imported, 60,840 pounds were brought to New York from San Francisco via Liverpool to avoid the heavy freight charges overland from California, and the actual imports were therefore only 947 pounds.

Camphor. The recent advance in the price of this article is a perfectly legitimate one. The consumption has been very large, partly owing to the former low prices, and partly through either the actual appearance or the dread of the cholera epidemic in different countries. The European refiners especially have been crowding in orders at the sources of production of crude (Japan and China), resulting in an exhaustion of the available supplies there and a very large, advance in price, fully 50 per cent. Through the general stagnation of business, the advance of refined camphor has stopped short of anticipations in our market, present prices being still far below the parity of cost of crude material, and 10 to 15 per cent. lower than quotations from European markets, but we believe that a revival of trade, which we may reasonably expect before long, will give the article a renewed stimulus and result in still higher prices, the more so as the supply in this country is but limited, and no addition to it can possibly reach here for the balance of the year.

Cantharides have again fluctuated considerably, and although much lower than the extreme figures reached during the period covered by our last report, have ruled considerably above average prices of former years.

The imports show a marked increase over the fiscal year ending with June 1883, and an increase of nearly 50 per cent. over the year ending with June 1884. At the close of our report Russian are reported very scarce and higher prices are predicted.

Cinchonidia Sulph. has steadily declined with quinine. Our report opened in August last at 50 cents for American in ounces, and closed at 25 cents for same, while foreign reached as low a figure as 12½ cents per ounce in large cans. Notwithstanding this low price, the demand has fallen off very perceptibly, and, with quinine below a dollar, it is not wanted in the proportion it was formerly.

Cream of Tartar has ranged from 31½ in January to 35½ at the close of our report. A new American manufacturer entering the field early in the year was the cause of a temporary fight and low figures, while a truce resulted in a combination and higher prices. One good result of the competition in this article has been the introduction of a higher standard of purity. The larger proportion of cream of tartar now sold by the drug trade contains 99 per cent. of bitartrate of potash, while 96 per cent. was the standard during former years. The consumption of cream of tartar is said to be not less than 8,500,000 pounds per annum in the United States.

Cubeb Berries have not fluctuated as violently as formerly, and, while still standing at a comparatively high point, have not furnished as lively contributions to our drug market reports as during the preceding years. A quantity of spurious berries reached our markets during the year, but it is not believed that any considerable amount was accepted by the trade, as the holders and manipulators of the true promptly notified the dealers of their appearance and characteristics.

Glycerin has continued its downward course, and is now quoted by the American manufacturers at a figure which the agents for the foreign article claim nets a loss to their principals, if met.

On referring to our table of imports it will be noticed that notwithstanding the advantages enjoyed by our manufacturers, over six million pounds of foreign was brought into New York during the year.

Guarana shows a wide range, opening at $2.25, reaching $4.00 in February and closing at $1.75 per lb.

Gum Arabic reached extreme figures during the period under review, going to 55 cents for first picked in March and closing at but little below that figure. The prospects appear to be in favor of continued high prices for some time to come.

Iodine and Salts.—Iodine, which opened at $1.85 in August, 1884, was advanced to $3.50 in November, and has ruled at that figure since. This is the result of a combination between the Chilian and European makers.

Reference to statistics shows quotations as follows:

London, 1884.	Sept. 27th.	4*d* per ounce.
	Oct. 11th.	3¾ to 4*d* per ounce.
	Nov. 8th.	Up to 7½*d*, 8*d* and 9*d*, paid.
	" 22d.	9*d* fixed as combination price, at which it has continued to rule to close of our report.

Iodide Potassium shows a corresponding advance, going from $1.23 in pounds in August to $2.83 in pounds in November, at which it still remains.

Insect Powder shows a much higher range of value, which is due to a smaller yield of the flowers, and the largely increased consumption of this article. Upwards of six hundred thousand pounds of flowers and powder were imported during the fiscal year ending with June 30, 1885.

Oil, Castor, has ruled steadily at high prices all this year. With reference to the large quantity noted in our table of imports, it is necessary to explain that nearly all of this was imported and warehoused during the summer and early fall of 1884. Only 792 pounds were entered in 1885 for consumption. It is probable that the greater proportion of the remainder was used by houses engaged in South American trade. Although no definite information can yet be obtained as to the crop of beans for this year, the opinion seems to be general that there is an increased acreage, and that the weather has been favorable for a good yield.

Oil, Cod Liver, receded considerably from the extreme position of last year. The production of Norwegian for 1885 is reported to be 13,905 barrels of 25 imperial gallons each, against 10,690 barrels for 1884, as reported last year. The quantity of Lofoden oil comprised in this stock is about 7,500 barrels, while the balance is made up of Finnmark.

Oils, Bergamot, Lemon and Orange, still show an exceptionally low range of price. It is feared that a continuance of depressed value may lead to such destruction of the trees as will result in scarcity and correspondingly higher cost hereafter. Many growers of the fruit, we are informed, have replaced their trees by vines, in order to have more profitable crops.

Oil, Peppermint, opening at $3.15 after falling off a little started on an upward turn and reached $4.50 in March, from which extreme point it has steadily receded; and the crop prospects being now exceptionally fine, much lower prices will doubtless follow the arrival of the new crop.

Opium has declined during the period under review, ranging from about $4, at the opening, to $3.50 at the close, per pound by the case.

Consumption of Turkey opium for the year 1884 to 1885, ending June 15th, 1885:

	Baskets.	
Arrivals in Smyrna since June 1884	2527	
Less reshipments to Constantinople	320	
		2207
Arrivals in Constantinople since June, 1884	2120	
Less reshipments to Smyrna	70	
		2050
Crop Salonica 1884 to 1885	800	
Less reshipments to Smyrna	20	
		780
Crop 1884 to 1885		5037
Stock in Smyrna June, 1884	1148	
" Constantinople in June, 1884	120	
" London and afloat	2800	
" America and afloat	700	
		4768
Total supply 1884 to 1885		9805
Less actual stock in Smyrna	507	
" " Constantinople	200	
" " London	2661	
" " America	300	
		3668
Consumption, baskets		6137

Opium shipments for the year 1884 to 1885:

To America	1575	Cases.
" England	291	"
" Holland*	350*	"
" France	53	"
" Austria and Germany	19	"
" Italy	18	"
" Spain	237	"
" The East	303	"
" Constantinople	320	"
	3166	"

Early in May we begin to receive reports of the estimate of the growing crop. This year the first report came about the 12th, placing the out-turn at 10,000 to 12,000 baskets. This was reduced later on to 8,000, and, after the report of damaging rains had been confirmed, the crop estimate was reduced to 6,000 to 7,000 baskets, at which those best informed place the yield of the crop now being harvested in Turkey. The arrivals this year have, so far, exceeded those of last year, although the total stock is somewhat less than at the same period of last year, the actual figures being:

Smyrna, August 14, 1885.—Arrivals during the week, 170; to date, 1440.

Against last year 842.

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[*] Note that 223 cases out of 350 have been shipped via England.

Actual spot stock, 1643. Last year 1793.

Stock in London, 2408. Against 2444 for 1884.

The arrivals in Constantinople have been, up to August 11th, 443, the present stock being 170 old, 165 new.

Prices have varied considerably during the year 1884 to 1885, the latest quotations being for prime 92 P., equal to 10s. 2d. Talequale, 87½ P., equal to 9s. 8d., while the price for prime at the corresponding period of last year was 118 P., 13s.

Since the latest mail advices, we have been informed by cable of a further decline to 8s. 9d. to 9s. for prime.

Root, *Ginseng*, has been in good demand for export trade, and has brought about $2.00 per pound for prime through the entire year.

Root, *Jalap*, has reached a very low figure, closing at about 12 cents per pound in bales.

Root, *Serpentaria*, was very scarce and brought extreme prices during most of the year, reaching 75 cents per pound in December, but again falling off to about opening figures at the close of our report.

Seed, *Canary*, shows but little change, but as our report closes rumors of a short crop prevail, and much higher prices are predicted.

Seeds, *Cardamom*, suffered a marked decline, falling from about $2.00 at the opening to $1.30 at the close of period under review.

Sulphate of Quinia and Cinchona Barks.

Sulphate of quinia, which was supposed at the close of our last report to have reached the lowest possible point, has, during the year under review, suffered a still further very material decline, being quoted now at 75 cents per ounce, in ounces for the American brand. The importations of sulphate of quinia and sulphate of cinchonidia during the fiscal year ending June 30, 1885, amount to 1,871,600 ounces, against 1,571,082 for the year ending June 30, 1884.

Below we give a list of prices of foreign brands during the year:

1884.	September.		Howard.	Pellitiers.	German.
			Vials.	*Vials.*	*Tins.*
	"	13th.	4–9	4–3	3–10
	October	11th.	4–6	4–	3–6 to 3–8
	November	8th.	4–3	3–9 to 3–10	3–6
	December	20th.	4–8	4–6	4– to 4–3
1885.	January	17th.	4–8	4–8	4–2 to 4–3
	February	28th.	4–6	4–4	3–9
	March	14th.	4–6	4–	3–7 to 3–8
	April	11th.	3–10	3–6 to 3–9	3–2
	May	23d.	3–10	3–8	3– to 3–2
	June	20th.	3–4	3–4	2–9
	July	4th	3–4	3–2	2–7 to 2–8
	August	15th	3–6	3–5	3–

With reference to the receipts of East India bark from Ceylon, the season of 1884 to 1885 is not yet finished, and we are only able to give figures from the 1st of October, 1884, to the 2d of July, 1885, and against these we give the importations for the same period for several years preceding, which will indicate the great increase in the exports of cinchona bark from the island of Ceylon.

1881 to 1882	1,598,891 pounds.
1882 to 1883	4,884,507 "
1883 to 1884	6,898,014 "
1884 to 1885	8,210,317 "

It may also be of interest to give some statistics in regard to bark exported from the island of Java. From July 1st to May 31st constitutes the season in Java.

1882 to 1883	388,231 pounds
1883 to 1884	1,038,934 "
1884 to 1885	1,083,555 "

We quote upon this subject ftom the "Review" of the drug trade of New York for the year 1884, to the Chamber of Commerce, by D. C. Robbins, Esq., as follows :

"Estimates of the past years, in regard to the harvests of bark in the East Indies, have always proved to be incorrect, and it is impossible to make an estimate which would prove to be correct, as to the amount of future shipments, and the quality of the same. The shipments of 1883 and 1884 were much larger than was expected, and the best information in regard to the cause of the same showed that the planters were obliged to sacrifice their half-grown as well as matured trees to realize money to pay their obligations. No doubt this has been done in very many cases. It is also understood that many plantations in Ceylon, from which large outturns were expected and calculated upon, have entirely disappointed their owners. The probabilities are that Java will furnish a much larger proportionate share of bark in the future than it has in the past.

"The auctions of the Dutch government in Amsterdam are yearly increasing in interest to buyers, and the finer varieties of bark, as the Ledgeriana, are much sought after.

"It is unfortunate that up to this time larger direct shipments have not been made of Eastern Cinchona Bark to this country, as there is no doubt that sales could be made to the mutual advantage of the producer and consumer.

"Very large portions of the eastern varieties are yearly purchased by the American manufacturer in the London market, where the negotiation of the transaction is always expensive, and a large portion of the expense attending same could be saved to the American manufacturer should the bark be sent direct to this market, and correspondingly higher prices would be paid to the producer. The direct shipment from the east, and also shipments from London to our own market of barks of this kind, have indeed been considerably greater than in previous years, the result of sales here has been entirely satisfactory to the shippers, and larger shipments, it is hoped, may be looked for."

The exceedingly low prices of quinia are due to the very large shipments of East India barks, and the keen competition of foreign manufacturers for the American market. The American manufacturers strongly contest this ground, and refuse to yield it even though this struggle involves manufacturing at a loss for a time. The fallacious idea that the removal of the 20 per cent. duty has brought about this reduction is thoroughly exploded in an article written by Mr. A. H. Jones and published in the January, 1885, number of the "Pharmacist."

We have not space here to insert the entire letter, but believing it to be of interest to the members of this Association and the drug trade of this country generally, and as bearing upon this point particularly, we quote the following:

"The duty on foreign sulphate quinine was removed July 1st, 1879. What were the prices that ruled in England before and since the removal of the duty? They may be learned from the following, taken from a Ceylon journal (*The Tropical Agriculturist*), pages 380, 381, 382, 383:

Years.	*Average Prices per Ounce.*			
'68	4s. 6¼d.	first six months	4s. 8½d.	last six months.
'69	6s. 4d.	"	5s. 8½d.	"
'70	5s. 10d.	"	6s. 2¾d.	"
'71	7s. 1d.	"	7s. 4¾d.	"
'72	7s. 9d.	"	7s. 5¾d.	"
'73	7s. 9¾d.	"	8s. 8¼d.	"
'74	7s. 8½d.	"	7s. 7¼d.	"
'75	6s. 10¾d.	"	6s. 8¼d.	"
'76	6s. 10½d.	"	9s.	"
'77	13s. 5¼d.	"	12s. 2½d.	"
'78	11s. 11½d.	"	11s. 9¼d.	"
'79	12s. 2d.	"	12s. 2½d.	"
'80	11s. 9½d.	"	12s.	"
'81	11s. 5½d.	"	9s. 1d.	"
'82	9s. 9d.	"	9s. 2½d.	"
'83	6s. 11¼d.	"	7s. 11d.	"
'84	6s. 0½d.	"		
'84	5s. 1¾d.	July and August."		

The question is frequently asked, What are the prospects for the future of this article? This it is exceedingly difficult to answer. It may be assumed, however, that for the reasons given above, unless some unforeseen circumstance happens, the price of quinine will rule at very low figures for some time to come. The prices of bark have recently experienced several important advances, and foreign makers of quinine appeared anxious to mark up their brands, but P. & W. remained steady through all these changes, showing clearly that they were determined to stand by their trade here, preferring, in order to maintain their ground, to bear heavy losses. It should not be forgotten that while domestic manufacturers depend entirely upon this country for an outlet for their entire production, the foreign manufacturers have a large outlet in Europe, South America, Asia, etc.

We may again profitably refer to the marked contrast between the policy of our government, which appears to be to crush out of existence this industry, and the wiser policy prevailing in foreign countries. The British government provides free solvents and fosters cinchona plantations.

Pharmacists individually and collectively should influence our legislators in every way in their power to change this course, remove the internal tax on alcohol which would place our manufacturing chemists in a position to enable them to retain the trade of their own country at least, and at the same time greatly lessen the cost of medicinal preparations to our people generally.

Imports, Fiscal Year 1884 to 1885. New York.

Acid, Boracic		142,952	Pounds.
“ Carbolic.		244,116	“
“ Citric.		70,035	“
Ammonia Carb.		406,446	“
Argols		16,231,923	“
Asafetida		214,709	“
Bark, Cinchona		330,497	“
“ Peru		943,968	“
Borax, Refined	947 60,840	61,787	“
Canary Seed		5,349,606	“
Cantharides		22,304	“
Camphor (Crude)		2,214,839	“
Cubebs.		87,959	“
Ergot		108,475	“
Glycerin		6,047,396	“
Gum Arabic.		1,469,294	“
Hempseed		287,793	“
Insect Flowers.		165,505	“
“ Powder.		456,609	“
Licorice Paste.		1,228,612	“
“ Root		32,042,893	“
Magnesia Carb		98,495	“
Morphia.		16,674	Ounces.
Oil, Castor		43,883	Gallons.
“ Cod Liver.		92,990	“
Opium		149,721	Pounds.
Quinine and Cinchonidia		1,871,600	Ounces.
Soap, Castile		2,728,185	Pounds.
Import of Quinia Sulph. during fiscal year ending June 30, 1884.		1,263,732	Ounces.

TABULATED REPORT OF PACKAGE PRICES.

	1884.					1885.						
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.
Acid Benzoin, Eng.	$2 08	2 08	$2 08	$1 92	$1 92	$1 90	$1 90	$1 98	$2 00	$2 00	$2 08	$2 24
" Citric	46	46	47	46	45	45	45	48	55	53	48	49
" Oxalic.	11	10¾	10½	10½	10½	10½	10¼	10	9½	9⅜	9	8¼
" Salicylic	1 75	1 75	1 75	1 75	1 75	1 70	1 70	1 70	1 70	1 70	1 70	1 70
" Tartaric Powd.	42	42	40½	40½	40	39	42	43½	45½	45	45	45
Alcohol, highest	2 03	2 08	2 10	2 10	2 11	2 11	2 12½	2 12	2 10	2 10	2 12	2 10
" lowest	2 02	2 01	2 09	2 07	2 08	2 08½	2 10	2 10	2 09	2 09	2 10	2 00
Ammonia Carb.	11	11	11½	11	11	11	11	11	10½	10½	10½	10¾
Bal. Copaiba	42	39	38	38	36	35	42	40	38	38	34	33
" Peru	1 85	1 85	1 82½	1 80	1 80	1 75	1 70	1 60	1 55	1 55	1 55	1 70
" Tolu	38	39	45	40	40	39	37	40	40	38	36	35
Borax	9¼	9½	9½	9½	9¼	8¾	8⅞	8¾	8¾	8½	8½	8½
Camphor	17¼	17	16½	16½	16¼	16½	17	18	17½	17¾	17½	22½
Cantharides, Russ.	1 35	2 00	1 75	1 70	1 60	1 70	1 70	1 60	1 60	1 58	1 40	1 50
" Chinese	90	1 75	1 60	1 50	1 40	1 25	1 30	1 30	1 20	1 20	1 15	1 15
Cinchonidia Sulph.	50	45	40	40	40	40	40	35	30	25	25	25
Cubeb Berries	60	60	50	45	45	65	85	80	70	65	62	70
Cream Tartar Powd.	32	32½	33½	32	(99%) 32	31½	33	36	36	35	35½	35½
Ergot, Spanish	25	25	25	25	25	25	25	25	22	25	25	22
Flowers, Arnica	6¾	7	7½	7½	7	7	7½	7	9½	9	8	8½
" Chamomile, Ger.	22	20	18	18	17½	20	19	18	20	20	19	25
" " Rom.	13	14	14	14	14	12	12	13	12	12	12	12
Glycerin	20	19	17	15½	15½	15½	15½	15½	15½	15½	15	15
Guarana	2 25	2 25	2 35	3 25	3 75	3 50	4 00	3 50	2 50	2 20	1 75	1 75
Gum Arabic, 1st	35½	34½	35	38½	40	39	45	55	51	49	48	48½
" Assafetida	14	14	14	14	16	16	16	16	15	14	13	14
" Opium	4 05	4 00	3 90	4 00	4 00	3 90	3 95	3 75	3 70	3 65	3 50	3 50
Iodine Resubl.	1 85	1 85	1 95	2 45 to 3 50	3 50	3 50	3 50	3 50	3 50	3 50	3 50	3 50

TABULATED REPORT OF PACKAGE PRICES (*Continued*).

	1884.					1885.						
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.
Insect Powder	20	20	20	22	30	28	30	30	30	28	27	27
Morphia Sulph P. & W. 1/8s	$3 40	$3 20	$3 20	$3 20	$3 20	$3 20	$3 20	$3 20	$3 20	$3 20	$3 20	$3 20
Oil, Bergamot	1 65	1 75	1 75	1 75	1 70	1 70	1 72½	1 72½	1 70	1 65	1 65	1 60
" Castor	18½	18	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½
" Cod Liver, New F.	1 15	1 15	1 15	1 10	1 10	1 10	1 05	1 00	1 00	95	85	85
" " Norweg	49 50	44 00	40 00	47 50	60 00	45 00	45 00	45 00	40 00	35 00	33 00	33 00
" Lemon	1 35	1 40	1 40	1 40	1 40	1 40	1 32½	1 32½	1 32½	1 25	1 25	1 25
" Olive Malaga	85	83	82½	95	95	90	89	87½	85	83	80	80
" Peppermint	3 15	2 75	2 75	2 85	3 00	4 00	4 15	4 50	4 25	4 25	4 00	3 90
Pot. Bromide	28	27	27	30	30	32	32	35	35	35	35	35
" Iodide	1 23	1 23	1 38	2 83	2 83	2 83	2 83	2 83	2 83	2 83	2 83	2 83
Quinine Sulph. highest	1 30	1 10	1 00	95	1 05	1 05	1 05	1 00	90	90	80	75
" " lowest	1 10	1 00	95	90	95	1 05	1 05	90	90	80	75	75
Root, Gentian	6	6	6	6	5½	5¼	5	5	4¾	4½	4¼	4¼
" Ginseng	2 10	2 10	1 95	1 65	1 90	1 90	1 95	2 10	2 10	2 20	2 20	2 00
" Ipecac	77½	75	80	80	70	80	85	98	90	90	80	90
" Jalap	16	16	16	15	15	16	14½	14½	13½	12½	12	12
" Serpentaria	36	45	50	70	75	70	65	65	60	60	45	40
Seed, Canary, Sicily	3⅝	3½	3¾	3¾	3½	3⅜	3½	3½	3½	3½	3⅜	3½
" Cardamom	1 95	1 90	1 80	1 75	1 80	1 70	1 70	1 65	1 40	1 40	1 30	1 30
" Hemp	4½	4½	4½	4½	3¾	3½	3¾	3½	3⅜	3¼	3¼	3¼
" Rape	5¼	4⅝	4¼	4¼	4¼	4	4½	4¼	4½	4⅝	4½	4¼
Soap, Castile, Mottled	7¼	6¾	7	7	7	6¾	6½	7½	8	7½	6¾	7
" " White Conti.	11½	12¼	15	12½	12	11½	11⅜	11½	11½	11	10⅞	10⅞

REPORT OF THE COMMITTEE ON LEGISLATION.

The appointment of a special Committee for the purpose of presenting to Congress and urging before that body the passage of a bill giving a commission to the apothecaries of the army and navy, met with various obstacles; the bill was therefore through the agency of a member of this Association, placed in the hands of Hon. Samuel J. Randall of Pennsylvania, by whom it was presented in January last to the House of Representatives, which body referred it to the Committee on Military Affairs, and there it received no action. The bill was printed on page 320 of the "Proceedings" for 1883.

Subsequently a letter from a hospital steward of the army was received, directed to the Secretary of this Association, and, at the request of its writer, published in the "American Druggist" for January last. The writer states that the social status of the hospital stewards of the army is no better than that of the common soldier; that their pay is $30, or $4 less than that of commissary sergeants and quartermaster sergeants; their allowances: one room in or near the hospital, one stove, one ration per day, one cord of wood per month, and uniform allowances with quantity and quality of a private soldier; that their duties are to compound all medicines, to extract teeth, dress wounds, care for the sick, conduct the hospital mess, make weather observations, perform all clerical duties, assist the surgeon, and, during his absence, take charge of the medical department of the post; and that to obtain such a position an examination must be passed "in English language, chemistry, pharmacy, materia medica, minor surgery, preparing and compounding of medicines, physical condition, moral character, ability to control men and manage an ordinary hospital, as well as general aptitude for the position."

The members of the Committee on Legislation are in earnest sympathy with the spirit of the resolution passed at the Niagara Falls meeting, and are willing and ready to argue the justice of the proposed measure before the proper Congressional Committee; but they believe that a committee specially selected for the purpose would be more likely to secure the consideration of the bill, and, we hope, its passage.

The past year has again witnessed the unsuccessful struggle for the regulation of the practice of pharmacy in several States, while in others amendments to existing pharmacy acts have been under consideration either by the legislatures or by the pharmaceutical associations. It becomes every year more apparent that there is no unity of sentiment or action in regard to the fundamental principles which should guide pharmaceutical legislation. Since the appointment and removal of Commissioners of Pharmacy have sometimes been made solely for so-called political reasons, it would seem to be eminently necessary to primarily guard against such occurrences. The amount of service before examination varies considerably, and by many laws is not required; hence the value of mere examiamination is overrated. Special professional education is in most cases recognized, but in others is totally thrown aside. A medical education without pharmaceutical experience is by a number of laws held to be equivalent, if not superior, to life-long practice of pharmacy. The limitation of the privileges conferred by registration, after relinquishing the business, is often overlooked, and the necessity or uselessness of the periodical renewal of registration has not been settled. Other discrepancies in pharmaceutical legislation might be mentioned; but it must also be acknowledged that some of the evils resulting from such differences have been lessened or in some cases abrogated by the courtesy of the boards, rather than by the language of the law.

During the past year new pharmacy laws have been passed in four States, and the older law of a fifth State, Maine, has been amended.

In *Kansas* the Board of Pharmacy consists of five pharmacists, appointed by the Governor. Pharmacists actually in business, also graduates of recognized schools and licentiates of other State Boards, are registered for a fee of $2, and assistants for $1, the latter being required to be at least 16 years of age, and to have not less than four years' experience in prescription stores. Registration may also be secured by examination, the fee being $5. The certificates are to be annually renewed at a cost of 50 cents. The members of the Board receive $3 per day and actual traveling expenses. Physicians supplying their own patients with medicine are exempt from registration. The adulteration of medicines is subject to a fine not exceeding $100, and to the erasure of the name from the register. The correct labeling and registration of poisons enumerated, and for no obvious reason placed in two schedules, is required, and the dispenser is obliged to retain all prescriptions.

The Kansas Prohibitory Law of 1881 was amended by an act approved March 7, 1885, and contains two sections referring to druggists, which are appended to this report.

The amended pharmacy law of *Maine* was passed without the knowledge of the Commissioners of Pharmacy, and in our opinion cannot be regarded as an improvement of the old law (see Proceedings 1877, p. 381 and 385). As heretofore, three *suitable persons*, appointed by the Governor, are to act as Commissioners, and graduates in medicine as well as graduates in pharmacy are entitled to registration, if competent; but graduates in medicine in active practice are exempt from registration, whether they carry on the business of an apothecary (Sec. 4), or dispense to their own patients (Sec. 11). Apothecaries in business at the time when the first law went into operation are not required to, but may be registered on proof of competency (Sec. 4 and 8). All others, whether now in business or hereafter entering upon it, must submit to an examination, the fee being $10, or $5 for an assistant of at least 18 years of age, and not less than two years engaged in a dispensing pharmacy. Women, if competent, may carry on the business (Sec. 10), also unregistered persons as partners of a registered pharmacist (Sec. 4), or employing one for dispensing, etc. (Sec. 13). The Commissioners are required to prosecute unregistered apothecaries (Sec. 9).

In *Massachusetts* the Board of Registration in pharmacy is appointed by the Governor and consists of five skilled pharmacists of not less than ten years' practical experience, of whom one retires each year. Persons or firms engaged in the business at the time of the passage of the act, and other persons having had three consecutive years of practical experience in the business, are registered, the fee being 50 cents. Others have to be examined, for which the fee is $5, and for a re-examination $3. Unregistered partners of pharmacists are not permitted to sell or dispense medicines except under supervision. All fees are paid into the treasury of the Commonwealth, and used for paying for the services of the members of the Board at the rate of $5 per day, and 3 cents mileage. At least three meetings are to be held annually. The sale and dispensing of medicines by an unregistered person is subject to a fine not exceeding $50. The law does not apply to physicians dispensing to their patients, nor to the sale of non-poisonous domestic remedies by grocers or others.

In *Michigan* the Board of Pharmacy is appointed in the same manner and for the same time as in Massachusetts, and is required to hold annually at least three meetings; the provisions for the first registration are likewise the same, except that the fee is $2, and that those two years in the business and 18 years of age may be registered as assistants for $1. Applicants for examination as licentiates must be 18 years of age (business experience is not stated), of temperate habits, and pay $3—a re-examination is granted within one year without additional payment—licentiates of other Boards of Pharmacy may be registered for $2. The annual renewal of registration is required, the fees being not more than $1 for a pharmacist, or 50 cents for an assistant. Stores, the proprietors of which are not registered, must be placed in charge of a registered pharmacist, and the sale and dispensing of medicines by unregistered persons can be done only under the supervision of a registered pharmacist or assistant. Violations of the law are subject to a fine of from ten to one hundred dollars, or imprisonment for from ten to ninety days, or both. The act does not apply to physicians dispensing to their patients, nor—except as to compounding physicians' prescriptions—to retail dealers in business five miles or more from an incorporated village or city. A number of chemicals and preparations, including tincture of aconite, are enumerated in Sec. 10, the sale of which seems to be unrestricted; but cathartic and quinine pills must be compounded and put up by a registered pharmacist; while all drugs, medicines, chemicals, essential oils and tinctures, if put up by a pharmacist or druggist, and properly labeled, including doses, and, if necessary, the name of a common antidote, may be sold by any person. Sec. 11 makes provision against the adulteration of drugs, and Sec. 12 exempts the senior pharmacist of every dispensing house from jury duty. The first Board is composed of Ottmar Eberbach, Ann Arbor; James Vernor, Detroit; Jacob Jesson, Muskegon; F. H. J. Van Emster, Bay City; and George McDonald, Kalamazoo.

In *Minnesota* the Board of Pharmacy is appointed by the Governor from nominees presented by the State Pharmaceutical Association, the members of the Board serving for five years, and one retiring each year. Pharmacists actually in business, as well as assistants having seven years' experience, graduates in pharmacy of four years' experience, and licentiates of other State Boards, are registered for a fee of $2 (Sec. 9). The Board may discriminate against schools of pharmacy (Sec. 3), or State Boards (Sec. 4), but not against medical colleges, graduates in medicine being entitled to registration (Sec. 2) without any pharmaceutical experience, and apparently without fee. The examination fee of $5 is refunded to the unsuccessful candidates. The cost of annual registration is not to exceed $2 (Sec. 10). Assistants at the time of the passage of the act, aged at least 18 years and with at least three years' dispensing experience, become registered assistants, the fee being $1 and the annual renewal fee 50 cents (Sec. 8); but, as in the Michigan law, no provision is made for registered assistants in the future. All registered under the act are exempt from jury duty (Sec. 17). The compensation of the members of the Board has been fixed at $5 a day and traveling expenses. Violations of the law are liable to a penalty of $50 (Sec. 12); but persons having neglected the annual renewal of their certificates, may be again registered—or as the law states, renew their membership—by the payment of all dues within two years (Sec. 16). The act does not apply to physicians dispensing to their patients, nor to the sale of any medicine put up and labelled by a pharmacist or physician, nor to medicines or poisons put up by a registered pharmacist and sold by shopkeepers at a distance of one mile from a drug store. Proprietors are held responsible for their medicines, unless sold in original packages (Sec. 13), and are required to distinctly label certain poisons and exercise due care in selling them (Sec. 14). Prosecutions are conducted by the county attorney, the penalties collected inuring to the Board of Pharmacy and the county school fund (Sec. 15). The Board appointed under this act consists of Dr. T. F. Stark, president; W. S. Getty, St. Paul; H. G. Webster, Minneapolis; S. L. Crocker, Faribault; and Robt. O. Sweeny, St. Paul, Secretary.

In addition to this law, the new penal code of Minnesota contains provisions specially affecting apothecaries, and declaring the following to be misdemeanors: The putting up of prescriptions by unqualified persons; the omission to label, or the incorrect labeling of medicines; the omission to record sales of poisons, or to attach the word "poison" to the label; the adulteration of foods and drugs, and the disposing of tainted food.

Copies of the different acts are attached to this report.

Respectfully submitted,
JOHN M. MAISCH,
S. A. D. SHEPPARD,
EDMUND BOCKING.

PHARMACY LAW OF KANSAS.

AN ACT ENTITLED "AN ACT TO PREVENT INCOMPETENT OR UNAUTHORIZED PERSONS FROM ENGAGING IN THE PRACTICE OF PHARMACY; ALSO TO REGULATE THE SALE OF POISONS AND PROPRIETARY MEDICINES; TO PREVENT AND PUNISH THE ADULTERATION OF DRUGS, MEDICINES, MEDICINAL PREPARATIONS, AND CHEMICALS; AND TO CREATE A BOARD OF PHARMACY FOR THE REGULATION OF THE PRACTICE OF PHARMACY IN THE STATE OF KANSAS."

SECTION 1. *Be it enacted by the Legislature of the State of Kansas:* It shall hereafter be unlawful for any person within the State of Kansas to open or conduct any pharmacy, or store, for retailing, dispensing or compounding medicines or poisons, unless such person be a registered pharmacist within the meaning of this act, or shall employ a registered pharmacist to conduct the same. And it shall be unlawful for any person to compound and sell at retail any medicines or poisons, or to compound or dispense any physician's prescriptions, unless such person be a registered pharmacist, or a registered assistant pharmacist, within the meaning of this act, except as hereinafter provided. Any person violating the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be liable to a fine of not less than twenty-five dollars nor more than one hundred dollars for each and every such offense.

SEC. 2. Immediately upon the passage of this act, the Governor shall appoint five reputable and practicing pharmacists doing business within the State. Said pharmacists, so appointed, shall constitute the Board of Pharmacy of the State of Kansas, and shall hold office, as respectively designated in their appointments, two for the term of one year, two for the term of two years, and one for the term of three years, respectively, as hereinafter provided, and until their successors have been duly appointed and qualified. The Governor shall annually thereafter appoint one or more pharmacist[s] to fill the vacancy annually occurring in said board. The term of office in said board shall be three years. In case of death, resignation or removal from the State of any member of the said board, or of a vacancy occurring from any cause, the Governor shall fill the vacancy by appointing a registered pharmacist to serve as a member of the board for the remainder of the term. It shall be the duty of the members of this board, after receipt of notification of their appointment, to make and subscribe to an oath properly and faithfully to discharge the duties of their office, and within thirty days thereafter meet and organize by the election of a president, secretary and treasurer, to be selected from the members of the board.

SEC. 3. The Board of Pharmacy shall register in a suitable book, a duplicate of which shall be kept in the office of the Secretary of State, the names and places of residence of all persons to whom they issue certificates, and the date thereof. A copy of the records of the board, or of any portion thereof, certified by its secretary, shall be deemed lawful evidence in any court of this State.

SEC. 4. It shall be the duty of said Board of Pharmacy to register, upon due application, without examination—first, as registered pharmacists, all pharmacists or druggists who were engaged in business in the State of Kansas at the time of the passage of this act, and are still engaged as owners or principals of stores or pharmacies, or selling at retail, compounding or dispensing drugs, medicines or chemicals for medicinal use, or for compounding and dispensing physicians' prescriptions; also, as assistant pharmacists, all druggists' clerks, of the age of sixteen years or over, who have been engaged as such in some store or pharmacy where physicians' prescriptions were compounded and dispensed for a term of not less than four years, and were employed as such in the State of Kansas at the time of the passage of this act. No registered assistant pharmacist shall open or conduct a pharmacy on his own account, or be granted a certificate as registered pharmacist, until he shall have passed an examination, as hereinafter provided.

SEC. 5. Every person claiming the right of registration as registered pharmacist under this act shall, within sixty days after the organization of the Board of Pharmacy, forward to the said board his affidavit, properly attested by some notary public, that he was engaged in the business of preparing and dispensing medicines and physicians' prescriptions within the State of Kansas at the time of the passage of this act, and still so engaged; and his application shall be accompanied by the sum of two dollars. The Board of Pharmacy shall thereupon register him as a registered pharmacist, and shall then issue to said applicant a certificate of registration, which certificate shall constantly be exposed conspicuously in the pharmacy to which it applies. Any person entitled to such registration under this act, failing to comply with the foregoing provisions, shall forfeit his right to registration, and shall appear before the Board of Pharmacy for examination as hereinafter provided. The Board of Pharmacy may at any time register as registered pharmacists, without further examination, the graduates of recognized schools of pharmacy, and the licentiates of other State Boards of Pharmacy.

SEC. 6. Any person desiring registration as registered assistant pharmacist may at any time transmit to the secretary of the Board of Pharmacy satisfactory evidence, under oath, that he is qualified as an assistant pharmacist under the provisions of section 4 of this act, and accompany the same with the sum of one dollar; upon which he shall be registered as registered assistant pharmacist, and receive a certificate as such.

SEC. 7. It shall be the duty of every registered pharmacist or assistant pharmacist, upon changing his place of business, forthwith to notify by letter the secretary of the Board of Pharmacy of such change, and to enclose a fee of fifty cents, upon receipt of which the secretary shall make the necessary alteration in his register. It shall also be the duty of every registered pharmacist or assistant pharmacist to notify by letter said secretary, on the first day of July in each year, whether he still continues practicing pharmacy at the registered place of business. The secretary shall notify every person who shall not have notified the board as herein provided, and in case an answer, enclosing a fee of fifty cents, shall not be received by the secretary within thirty days, such name shall be stricken from the register: *Provided, always*, that his name may be restored to the register on the payment to the secretary, within one year, of a fee of five dollars. It shall be the duty of the secretary of the board to erase from the registry the name of any registered pharmacist who may have died, removed from, or ceased to do business in this State, and to make all necessary alterations in the location of the person registered under this act. He shall publish annually a list of all persons that are duly registered as pharmacists and assistant pharmacists, a copy of which shall be mailed free to each and every registered pharmacist and assistant pharmacist in the State.

SEC. 8. Any person not entitled to registration under the preceding provisions, and who may desire a certificate as registered pharmacist, shall apply for examination to the Board of Pharmacy, and shall pay to the secretary of the board the sum of five dollars. If the board shall find that he has had a practical experience of four years in compounding physicians' prescriptions and in the general duties of pharmacy, and is otherwise duly qualified, they shall duly register him, and issue him a certificate as registered pharmacist. In case of failure to pass a satisfactory examination, a second examination may be granted within six months, without further payment.

SEC. 9. Said Board of Pharmacy shall meet at least once in three months to perform the duties required by this act. The members of the Board shall receive the sum of three dollars for each day engaged in such service, together with actual traveling expenses, to be paid from the treasury of the Kansas Board of Pharmacy. All fees collected under the provisions of this act shall be paid over at once to the treasurer of said Board.

SEC. 10. Every proprietor or conductor of a drug store or a pharmacy shall be held responsible for the quality of all drugs, chemicals and medicines he may sell or dispense; and should he knowingly, intentionally and fraudulently adulterate, or cause to be adulterated, such drugs, chemicals or medical preparations, he shall be deemed guilty of a misdemeanor, and, upon conviction thereof, be liable to a penalty not exceeding one hundred dollars, and, in addition thereto, his name be stricken from the register.

SEC. 11. Nothing hereinbefore contained in this act shall apply to any practitioner of medicine who does not keep open shop for retailing, dispensing or compounding of medicines or poisons, nor prevent him from administering or supplying to his patients such articles as he may deem fit and proper. And it is also provided that in rural districts, where there is no registered pharmacist within five miles, it shall be lawful for retail dealers to procure license from the Board of Pharmacy at a fee of two dollars and fifty cents annually, to sell the usual domestic remedies and medicines, not including any articles enumerated in schedules A and B of this act.

SEC. 12. Pharmacists registered as herein provided shall have the right to keep and sell, under such restrictions as herein provided, all medicines and poisons authorized by the National, American or United States dispensatory and pharmacopœia as of recognized medicinal utility: *Provided*, That nothing herein contained shall be construed so as to apply to intoxicating liquors. It shall be unlawful for any person, from and after the passage of this act, to retail any articles enumerated in schedules A and B, except as follows:

SCHEDULE A.

Arsenic and its preparations, corrosive sublimate, white precipitate, red precipitate, biniodide of mercury, cyanide of potassium, hydrocyanic acid, strychnia, and all other poisonous vegetable alkaloids, and their salts, essential oil of bitter almonds, opium and its preparations, except paregoric and other preparations of opium containing less than two grains to the ounce.

SCHEDULE B.

Aconite, belladonna, colchicum, conium, nux vomica, henbane, savin, ergot, cotton root, cantharides, creosote, digitalis, and their pharmaceutical preparations, croton oil, chloroform, chloral hydrate, sulphate of zinc, mineral acids, carbolic acid, oxalic acid, and all other virulent poisons.

Articles enumerated in schedules A and B shall not be sold without distinctly labeling the box, vessel, or paper, in which the said poison is contained, and also the outside wrapper or cover, with the name of the article, the word "poison," and the name and place of business of the seller. Nor shall it be lawful for any person to sell or deliver any poisons enumerated in schedules A and B, unless upon due inquiry it be found that the purchaser is aware of its poisonous character, and represents that it is to be used for a legitimate purpose. Nor shall it be lawful for any proprietor or owner of any drug store or pharmacy, or any registered pharmacist, to sell or deliver any articles included in the schedules A and B, without, before delivering the same to the purchaser, causing an entry to be made in a book kept for that purpose, stating the date of sale, the article sold, the quantity thereof, the purpose for which it is represented by the purchaser to be required, the name of the dispenser, and the name and address of the purchaser signed by himself; such book to be always open for inspection by the proper authorities, and to be preserved for at least five years. The provisions of this section shall not apply to the sale of poisons to practicing physicians and photographers, and to the dispensing of poisons in not unusual doses or quantities upon the prescriptions of licensed practitioners of medicine. All prescriptions of practicing physicians shall be retained by the dispenser. Any person procuring from any pharmacist articles enumerated in schedules A and B under fraudulent representations shall be deemed guilty of a misdemeanor, and be liable to a fine of not less than twenty five nor more than one hundred dollars.

SEC. 13. Any person who shall procure, or attempt to procure, registration for himself or for another under this act, by making, or causing to be made, any false representation, and any registered pharmacist who shall be in the habit of being intoxicated, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof, be liable to a penalty of not less than twenty-five nor more than one hundred dollars, and the name of the person so fraudulently registered shall be stricken from the register.

SEC. 14. This act shall take effect and be in force from and after its publication in the statutes.

Approved March 5, 1885.

PROHIBITORY LAW OF KANSAS, AMENDED MARCH 7, 1885.

SEC. 4. Any druggist having a permit to sell intoxicating liquors under the provisions of this act, may sell the same for medical purposes, upon the written or printed statement of the applicant, as hereinafter provided, or upon the written or printed prescription made and signed by a physician lawfully practicing his profession in the county wherein such druggist carries on his business, and such written or printed statement of the applicant; and such druggist shall sell intoxicating liquors for mechanical and scientific purposes only upon the written or printed statement of the applicant, setting forth the particular purpose for which such liquor is required, the kind and quantity desired, and that it is not intended for a beverage, nor to sell or give away; and when desired for medical purposes, the said written or printed statement shall contain the foregoing particulars, and in addition thereto shall state that the liquor is necessary, and actually needed for medical use for the patient to be named, and there shall be but one sale and but one delivery on any one prescription or statement; but no druggist shall permit the drinking on his premises of liquor purchased by prescription or otherwise: *Provided*, That such druggist shall be permitted to sell to any regular practicing physician who is engaged in the practice of his profession any of the liquors above named, upon his written or printed statement that said liquors will only be used for medicinal purposes. The statements provided for in this section shall be signed by the applicant in each case, in the presence of and attested by the druggist to whom they are presented, and shall be retained by such druggist, and at the end of every thirty days, or within that time, said statements and prescriptions, together with the druggist's affidavit that the liquors therein mentioned are all the intoxicating liquors sold by him during the month, shall be filed by him in the office of the Probate Judge who issued his permit, where they shall be safely kept for two years from the date of said filing. Every person whose statement so made for the purpose of obtaining intoxicating liquors shall be false in any material matter, or who shall sell or furnish any of the liquors thereon obtained to others as a beverage, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than one hundred dollars nor more than five hundred dollars, and by imprisonment in the county jail not less than thirty days nor more than ninety days. Every such druggist shall keep a book, wherein shall be recorded all sales of intoxicating liquors made by him, showing the name and residence of the purchaser, the kind and quantity of liquor sold, the purpose for which it was sold, the date of each sale, and if upon prescription, the name of the physician making the same. Such record and prescriptions shall be open to the examination of the public at all reasonable times during business hours.

SEC. 7. Any person without taking out and having a permit to sell intoxicating liquors, as provided in this act, or any person not lawfully and in good faith engaged in the business of a druggist, who shall directly or indirectly sell or barter any spirituous, malt, vinous, fermented, or other intoxicating liquors, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than one hundred dollars nor more than five hundred dollars, and be imprisoned in the county jail not less than thirty days nor more than ninety days.

AMENDED PHARMACY LAW OF MAINE.

AN ACT TO PREVENT INCOMPETENT PERSONS FROM CONDUCTING THE BUSINESS OF APOTHECARIES.

Be it enacted by the Senate and House of Representatives in Legislature assembled as follows:

CHAPTER 379.

SECTION 1. From and after the passage of this act, it shall not be lawful for any person, within the limits of the State, to conduct the business of an apothecary, or any part thereof, except as hereinafter provided.

SEC. 2. The governor, under the advice and consent of the council, shall appoint three suitable persons to be commissioners of pharmacy, one commissioner to be appointed as the term of each of those now holding office shall expire, to hold office for the term of three years, unless removed for cause, and until a successor is appointed and qualified. If a vacancy occurs in said commission, another shall be appointed as aforesaid, to fill the unexpired term thereof. Before entering on the duties of their office, the commissioners shall be sworn to faithfully and impartially discharge the same, and a record shall be made thereof on their commission.

SEC. 3. Said commissioners shall examine any person who desires to carry on the business of an apothecary, and if he is found skilled in pharmacy, shall give him a certificate of that fact and that he is authorized to engage in the business of an apothecary, and such certificate must be signed by at least two commissioners. They shall register in a suitable book, to be kept in the office of the secretary of state, the name and place of residence of all to whom they issue certificates, and the date thereof.

SEC. 4. Every person not now registered, unless he was engaged in the business of an apothecary on the eleventh day of March, in the year of our Lord eighteen hundred and seventy-seven, continuing in or hereafter entering on the business of an apothecary, shall be examined by said commissioners, and shall present to them satisfactory evidence that he has been an apprentice, or employed in an apothecary store where physicians' prescriptions are compounded, at least three years; or has graduated from some regularly incorporated medical college or college of pharmacy, and is competent for the business; and the commissioners may then grant him a certificate and registry as hereinbefore provided; but only one of the partners in a firm need be a registered druggist, provided the partner who compounds medicines be registered. And any physician who has a diploma as the graduate of a duly established medical college, and in active practice, may do the business of an apothecary without being registered.

SEC 5. For each examination under the provisions of this act, the commissioners shall be entitled to receive from the person examined ten dollars, except as hereinafter provided, which shall be in full for all services and expenses. In case the result of the examination is unsatisfactory, and no certificate is granted, the applicant shall have the right to another examination without charge after an interval of two months, and within twelve months after the date of his first examination.

SEC. 6. Certificates of two grades or kinds may be issued whereof one shall declare that the holder is skilled in pharmacy as in section four of this act, and the other kind, which, after the examination of the applicants therefor, may be issued to such as shall be not less than eighteen years of age and who have served two full years in an apothecary store where physicians' prescriptions are compounded, shall declare that the holder is a qualified assistant and is competent to take charge of the business of an apothecary, during the temporary absence of his employer, and the fee for such assistant's examinations shall be five dollars.

SEC. 7. It shall not be lawful for an apothecary store to be kept open for the sale of medicines or poisons, or for compounding physicians' prescriptions, unless the same is placed and kept under the personal control and supervision of a registered apothecary; or a qualified assistant who is satisfactory to the owners or heirs, may be employed to superintend the compounding of medicines.

SEC. 8. Any person engaged in the business of an apothecary on the eleventh day of March in the year of our Lord one thousand eight hundred and seventy-seven, may receive a certificate and be registered as aforesaid on application to said commissioners, with proof of his competency.

SEC. 9. If any person who was not engaged in the business of an apothecary on the eleventh day of March, in the year of our Lord eighteen hundred and seventy-seven, shall hereafter engage in, or carry on the business of an apothecary contrary to the provisions of this act, he shall be subject to a penalty of fifty dollars per month upon conviction of the first offense; and of one hundred dollars per month upon each and every subsequent conviction, whether of continuance in said business or for engaging anew therein in violation of the provisions of this act. And it shall be the duty of the commissioners to prosecute all such cases as may be brought to their notice accompanied by testimony; the penalty to be recovered by an action of debt in the name of the county attorney in any court of competent jurisdiction, to be paid into the county treasury.

SEC. 10. The provisions of this act shall apply in the cases of women who shall hereafter enter upon and carry on the business of apothecaries.

SEC. 11. This act shall not apply in the case of physicians who prepare and dispense their own medicines, nor to the sale of proprietary preparations.

SEC. 12. All acts and parts of acts inconsistent with this act are hereby repealed.

SEC. 13. Any person may enter upon the business of an apothecary without the certificate required by the foregoing act; provided he does not personally do the duties of an apothecary, but employs a duly registered apothecary who has sole charge of compounding, putting up and dispensing medicines and drugs under the provisions of this act.

SEC. 14. No action now pending by virtue of section six of chapter twenty eight of the revised statutes shall be maintained except as to costs, or shall hereafter be commenced for any penalty or forfeiture incurred prior to the approval of this act.

SEC. 15. The word apothecary as used in this act shall not include persons who do not compound medicines, put up prescriptions, or sell poisons.

SEC. 16. This act shall take effect when approved.

APPROVED, *March 6, 1885.*

PHARMACY LAW OF MASSACHUSETTS.

CHAPTER 313.

AN ACT TO ESTABLISH A BOARD OF REGISTRATION IN PHARMACY.

SEC. 1. *Be it enacted, etc., as follows:* The Governor of the Commonwealth with the advice and consent of the council shall appoint, after the passage of this act, five skilled pharmacists, resident in the Commonwealth, who have had ten consecutive years of practical experience in compounding and dispensing of physicians' prescriptions, who shall constitute a board of registration in pharmacy. Such persons shall be appointed and hold office, beginning on the first day of October next, one for one year, one for two years, one for three years, one for four years, and one for five years, or until their successors shall be appointed; and the Governor shall appoint annually thereafter before the first day of October in each year one skilled pharmacist, qualified as aforesaid, to hold office for five years from the first day of October next ensuing. Not more than one member of said board shall be interested in the sale of drugs, medicines and chemicals and the compounding and dispensing of physicians' prescriptions in the same city or town. All vacancies occurring in said board shall be filled in accordance with the provisions of this act for the establishment of the original board. Any member of said board may be removed from office for cause by the Governor with the advice and consent of the council.

SEC. 2. The members of said board shall meet on the first Tuesday of October next at such time and place as they may determine, and shall immediately proceed to organize by electing a president and secretary, who shall be members of the board and who shall hold their respective offices for the term of one year. The secretary shall give to the treasurer and receiver-general of the Commonwealth a bond with sufficient sureties, to be approved by the Governor and council, for the faithful discharge of the duties of his office. The said board shall hold three regular meetings in each year, one on the first Tuesday of January, one on the first Tuesday of May, and one on the first Tuesday of October, and such additional meetings at such times and places as they may determine.

SEC. 3. It shall be the duty of said board, immediately upon its organization, to notify all persons and firms engaged in the business of retailing or dispensing drugs, medicines, chemicals or poisons on their own account in this Commonwealth, of the provisions of this act; and any such person or firm so engaged, or any other person who has had three consecutive years of practical experience in the aforesaid business, shall, upon application and the payment of a fee of fifty cents to said board, be registered as a pharmacist, and shall receive a certificate thereof signed by the president and secretary of said board.

SEC. 4. Any person not entitled to registration as aforesaid shall, upon payment of a fee of five dollars, be entitled to examination, and if found qualified shall be registered as a pharmacist, and shall receive the certificate thereof provided for in section three. Any person may be re-examined at any regular meeting of the board upon the payment of a fee of three dollars. All fees received by the board under this act shall be paid by the secretary of the board into the treasury of the Commonwealth once in each month.

SEC. 5. The compensation, incidental and traveling expenses of the board shall be paid from the treasury of the Commonwealth. The compensation of the board shall be five dollars each for every day actually spent in the discharge of their duties, and three cents per mile each way for necessary traveling expenses in attending the meetings of the board, but in no case shall any more be paid than was actually expended. Such compensation and the incidental and traveling expenses shall be approved by the board and sent to the auditor of the Commonwealth, who shall certify to the Governor and council the amounts due as in case of all other bills and accounts approved by him under the provisions of law; *provided*, that the amount so paid shall not exceed the amount received by the treasurer and receiver-general of the Commonwealth from the board in fees as herein specified, and so much of said receipts as may be necessary is hereby appropriated for the compensation and expenses of the board as aforesaid.

SEC. 6. The board shall keep a record of the names of all persons registered hereunder, and a record of all moneys received and disbursed by said board, a duplicate whereof shall always be open to inspection in the office of the Secretary of the Commonwealth. Said board shall annually report to the Governor, on or before the first day of January in each year, the condition of pharmacy in the State, which report shall contain a full and complete record of all its official acts during the year, and shall also contain a statement of the receipts and disbursements of the board.

SEC. 7. It shall be the duty of the board to investigate all complaints of disregard, non-compliance or violation of the provisions of this act, and to bring all such cases to the notice of the proper prosecuting officers.

SEC 8. Every person who has received a certificate of registration from the board shall conspicuously display the same in his place of business.

SEC. 9. Whoever not being registered as aforesaid shall, by himself or his agent or servant, unless such agent or servant is so registered, retail, compound for sale or dispense for medicinal purposes, drugs, medicines, chemicals or poisons, shall be punished by a fine not exceeding fifty dollars. But nothing in this act shall be construed to prohibit the employment of apprentices or assistants under the personal supervision of a registered pharmacist.

SEC. 10. This act shall not apply to physicians putting up their own prescriptions or dispensing medicines to their patients; nor to the sale of drugs, medicines, chemicals, or poisons at wholesale only; nor to the manufacture or sale of patent and proprietary medicines; nor to the sale of non-poisonous domestic remedies usually sold by grocers or others; nor shall any member of a co-partnership be liable to the penalties hereof if any other member of such co-partnership is a registered pharmacist: *provided*, that such non-registered member shall not retail, compound for sale or dispense for medicinal purposes, drugs, medicines, chemicals or poisons, except under the personal supervision of a registered pharmacist.

SEC. 11. For the purposes of the appointment of said board, and of registration of persons by them hereunder, this act shall take effect upon its passage, and shall take full effect on the first day of January in the year eighteen hundred and eighty-six.

APPROVED *June 11, 1885.*

PHARMACY ACT OF MICHIGAN.

AN ACT TO REGULATE THE PRACTICE OF PHARMACY IN THE STATE OF MICHIGAN.

(ACT NO. 134, LAWS OF 1885.)

SECTION 1. *The People of the State of Michigan enact*, That the Governor, with the advice and consent of the Senate, shall, within thirty days after the passage of this act, appoint five persons, and annually thereafter one person, from among such competent pharmacists in the State as have had ten years' practical experience in dispensing physicians' prescriptions, who shall constitute the Michigan Board of Pharmacy. The terms of office of said five persons shall be so arranged that the term of one shall expire on the thirty-first day of December of each year, and all appointments made thereafter shall be for the term of five years.

SEC. 2. The said Board shall, within thirty days after its appointment, meet, and organize by the election of a President and Secretary, from its own members, who shall be elected for the term of one year, and shall perform the duties prescribed by the board. It should be the duty of the board to examine all applications for registration submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this act; to investigate complaints, and to cause the prosecution of all persons violating its provisions; to report annually to the Governor, and to the Michigan Pharmaceutical Association, upon the condition of pharmacy in the State, which said report shall also furnish a record of the proceedings of the said board for the year, and also the names of all pharmacists duly registered under this act; the board shall hold meetings for the examination of applicants for registration, and the transaction of such other business as shall pertain to its duties, at least once in four months, said meetings to be held on the first Tuesdays of March, July, and November in each year; shall make by-laws for the proper fulfillment of its duties under this act, and shall keep a book of registration in which shall be entered the names and places of business of all persons registered under this act, which book shall also specify such facts as said persons shall claim to justify their registration. The records of said board, or a copy of any part thereof, certified by the Secretary to be a true copy, attested by the seal of the board, shall be accepted as competent evidence in all courts of the State. Three members of said board shall constitute a quorum.

SEC. 3. The secretary of the board and the treasurer thereof, if such separate office be created, shall receive a salary, which shall be fixed by the board; they shall also receive the amount of their traveling and other expenses incurred in the performance of their official duties. The other members shall receive the sum of three dollars for each day actually engaged in this service, and all legitimate and necessary expenses incurred in the performance of their official duties. Said salaries, per diem and expenses, shall be paid from the fees received under the provisions of this act. All moneys received in excess of said per diem allowance, and other expenses above provided for, shall be paid into the State treasury at the end of each year, and so much thereof as shall be necessary to meet the current expenses of said board shall be subject to the order thereof, if, in any year, the receipts of said board shall not be equal to its expenses. The board shall make an annual report and render an account to the Board of State Auditors and to the Michigan Pharmaceutical Association, of all moneys received and disbursed by it pursuant to this act.

SEC. 4. Every person who shall, within three months after this act takes effect, forward to the Board of Pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of a dispensing pharmacist on his own account in this State at the time this act takes effect, in the preparation of physicians' prescriptions, or that at such time he had been employed or engaged three years or more as a pharmacist in the compounding of physicians' prescriptions, and was at said time so employed in this State, shall, upon the payment to the board of a fee of two dollars, be granted the certificate of a registered pharmacist: *Provided*, That in case of failure or neglect to register as herein provided, then such person shall, in order to be registered, comply with the requirements provided for registration as a licentiate in pharmacy, hereinafter described.

SEC. 5. No person other than a licentiate in pharmacy shall be entitled to registration as a pharmacist, except as provided in section four. Licentiates in pharmacy shall be such persons, not less than eighteen years of age, who shall have passed a satisfactory examination touching their competency before the Board of Pharmacy. Every such person shall, before an examination is granted, furnish satisfactory evidence that he is of temperate habits, and pay to the board a fee of three dollars: *Provided*, That in case of the failure of any applicant to pass a satisfactory examination, the money shall be held to his credit for a second examination at any time within one year. The said board may grant certificates of registration without further examination to the licentiates of such other Boards of Pharmacy as it may deem proper, upon a payment of a fee of two dollars.

SEC. 6. The said Board may grant, under such rules and regulations as it may deem proper, at a fee not exceeding one dollar, the certificate of registered assistant, to clerks or assistants in pharmacy, not less than eighteen years of age, who at the time this act takes effect shall be engaged in such service in this State, and have been employed or engaged two years or more in the practice of pharmacy, but such certificates shall not entitle the holder to engage in such business on his own account, or to take charge of or act as manager of a pharmacy or drug store.

SEC. 7. Every registered pharmacist, or registered assistant, who desires to continue the practice of his profession, shall annually, after the expiration of the first year of his registration, during the time he shall continue in such practice, on such date as the Board of Pharmacy may determine, pay to the said board a registration fee to be fixed by the board, but which shall not exceed one dollar for a pharmacist, or fifty cents for an assistant, for which he shall receive a renewal of said registration. Every person receiving a certificate under this act shall keep the same conspicuously exposed in his place of business. Every registered pharmacist, or assistant, shall, within ten days after changing his place of business or employment, as designated by his certificate, notify the secretary of the board of his new place of business. If any pharmacist or registered assistant shall fail or neglect to procure his annual registration, or to comply with the other provisions of this section, his right to act as such pharmacist or assistant shall cease at the expiration of ten days from the time notice of such failure to comply with the provisions of this section shall have been mailed to him by the Secretary of said Board.

SEC. 8. All or any registration obtained through false representations shall be void, and the Board of Pharmacy may hear complaints and evidence, and may revoke such certificates as it may deem improperly held.

SEC. 9. Any proprietor of a pharmacy who, not being a registered pharmacist, shall, ninety days after this act takes effect, fail or neglect to place in charge of such pharmacy a registered pharmacist; or any such proprietor who shall by himself, or any other person, permit the compounding or dispensing of prescriptions, or the vending of drugs, medicines, or poisons, in his store or place of business, except by or in the presence and under the supervision of a registered pharmacist, or except by a registered assistant; or any person, not being a registered pharmacist, who shall take charge of or act as manager of such pharmacy or store, or who, not being a registered pharmacist or registered assistant, shall retail, compound, or dispense drugs, medicines, or poisons; or any person violating any other provision of this act to which no other penalty is herein attached, shall be deemed guilty of a misdemeanor, and for every such offense, upon conviction thereof, shall be punished by a fine of not less than ten nor more than one hundred dollars, and in default of payment thereof, shall be imprisoned not less than ten days, nor more than ninety days, or both such fine and imprisonment, in the discretion of the court.

SEC. 10. Nothing in this act shall apply to, or in any manner interfere with the business of any practicing physician, who does not keep open shop for the retailing, dispensing, or compounding of medicines and poisons, or prevent him from supplying to his patients such articles as may seem to him proper, nor with the business of any retail dealer engaged in business at a distance of not less than five miles from the limits of any incorporated village or city, except physicians' prescriptions, nor with the vending of patent or proprietary medicines by any retail dealer, nor with the selling by any person of drugs, medicines, chemicals, essential oils and tinctures which are put up in bottles, boxes, or packages, bearing labels securely affixed, which labels shall bear the name of the pharmacist or druggist putting up the same, the dose that may be administered to persons three months, six months, one year, three years, five years, ten years, fifteen years, and twenty-one years of age, and, if a poison, the name or names of the most common antidotes; of copperas, borax, blue vitriol, saltpeter, pepper, sulphur, brimstone, Paris green, licorice, sage, senna leaves, castor oil, sweet oil, spirit of turpentine, glycerine, Glauber salts, Epsom salts, cream tartar, bi-carbonate of soda, sugar of lead, and such acids as are used in coloring and tanning, nor with the selling of paregoric, essence of peppermint, essence of ginger, essence of cinnamon, hive syrup, syrup of ipecac, tincture of arnica, syrup of tolu, syrup of squills, spirits of camphor, number six, sweet spirits of nitre, laudanum, quinine, and all other preparations of cinchona bark, tincture of aconite, and tincture of iron, compound cathartic pills, or quinine pills, when such cathartic or quinine pills are compounded by and put up in bottles or boxes bearing the label of a registered pharmacist, with the name of article and directions for its use on each bottle or box, nor with the exclusively wholesale business of any dealer.

SEC. 11. No person shall add to or remove from any drug, medicine, chemical, pharmaceutical preparation, any ingredient or material for the purpose of adulteration or substitution, which shall detoriorate the quality, commercial value or medicinal effect, or which shall alter the nature or composition of such drug, medicine, chemical, or pharmaceutical preparation, so that it will not correspond to the recognized tests of identity or purity. Any person who shall thus willfully adulterate or alter, or cause to be adulterated or altered, or shall sell or offer for sale, any such drug, medicine, chemical, or pharmaceutical preparation, or any person who shall substitute, or cause to be substituted, one material for another, with the intention to defraud or deceive the purchaser, shall be guilty of a misdemeanor, and be liable to prosecution under this act. If convicted he shall be liable to all the costs of the action, and for the first offense be liable to a fine of not less than ten dollars, no more than one hundred dollars, and for each subsequent offense, a fine of not less than twenty-five dollars nor more than one hundred and fifty dollars. On complaint being entered the Board of Pharmacy is hereby empowered to employ an analyst or chemist, whose duty it shall be to examine into the so-called adulteration, substitution, or alteration, and report upon the result of his investigation; and if said report shall be deemed to justify such action, the board shall duly cause the prosecution of the offender, as provided in this act.

SEC. 12. The senior pharmacist of every house dispensing and compounding medicines, registered under this act, shall be exempt and free from all jury duty in the courts of this State.

SEC. 13. All acts and parts of acts in conflict with the provisions of this act are hereby repealed.

ARCHIBALD BUTTARS, *President of the Senate.*
NEWCOMB CLARK, *Speaker of the House of Representatives.*

APPROVED, *June 2, 1885.*

RUSSELL A. ALGER, *Governor.*

PHARMACY ACT OF MINNESOTA.

AN ACT TO REGULATE THE PRACTICE OF PHARMACY, THE LICENSING OF PERSONS TO CARRY ON SUCH PRACTICE, AND THE SALE OF POISONS IN THE STATE OF MINNESOTA.

1. Forbids compounding or sale of drugs, medicines or poisons, except by registered pharmacists.

2. Who shall register.

3. Who shall be graduates of pharmacy.

4. Who shall be licentiates in pharmacy.

5. Board of Pharmacy. Governor to appoint. Minnesota Pharmaceutical Association to nominate candidates for appointment as members.

6. Organization of board. Duties of members and officers. Examination meetings. Quorum.

7. Requirements of persons claiming registry.

8. Assistant pharmacists to be registered. Fees.

9. Certificate for pharmacists, and fees for same.

10. Annual fees. Certificate to be open for public inspection.

11. Duties of secretary of board and salary. To be treasurer of the board. Bond. Disposition of funds.

12. Requires compliance with the provisions of this act within ninety days. Penalty for failure to comply. Exceptions.

13. Forbids adulteration of drugs. Penalty for same. Board to prosecute violations of this act.

14. All poisons to be labeled.

15. Prosecution of suits. Duty of County Attorneys. Disposition of penalties collected.

16. All other acts repealed. Forfeited membership.

17. Exempt from jury duty.

18. In force.

SECTION 1. *Be it enacted by the Legislature of the State of Minnesota:* That it shall hereafter be unlawful for any person, other than a registered pharmacist, to retail, compound or dispense drugs, medicines or poisons, or to institute or conduct any pharmacy, store or shop for retailing, compounding or dispensing drugs, medicines or poisons, unless such person shall be a registered pharmacist, or shall employ and place in charge of said pharmacy, store or shop a registered pharmacist, within the full meaning of this act, except as hereinafter provided.

SEC. 2. In order to be registered within the full meaning of this act, all persons must be either graduates in pharmacy, graduates in medicine, or shall at the time this act takes effect be engaged in the business of a dispensing pharmacist on their own account, in the State of Minnesota, in the preparation of phsyicians' prescriptions, and in the vending and compounding of drugs, medicines and poisons, or shall be licentiates in pharmacy.

SEC. 3. Graduates in pharmacy shall be considered to consist of such persons as have had four years' practical experience in drug stores where prescriptions of medical practitioners are compounded, and have obtained a diploma from such colleges or schools of pharmacy as shall be approved by the Board of Pharmacy, as sufficient guarantee of their attainments and proficiency.

SEC. 4. Licentiates in pharmacy shall be such persons as have had three years' practical experience in drug stores wherein the prescriptions of medical practitioners are compounded, and have sustained a satisfactory examination before the State Board of Pharmacy hereinafter mentioned. The State board may grant certificates of registration to licentiates of such other State boards as it may deem proper, without further examination.

SEC. 5. Immediately upon the passage of this act the Minnesota State Pharmaceutical Association shall elect fifteen (15) reputable and practicing pharmacists doing business in the State, from which number the Governor shall appoint five (5). The said pharmacists, duly elected and appointed, shall constitute the Board of Pharmacy of the State of Minnesota, and shall hold office as respectively designated in their appointments, for the term of one, two, three, four and five years respectively, as hereinafter provided, and until their successors shall be duly elected and appointed. The Minnesota State Pharmaceutical Association shall annually thereafter elect five (5) pharmacists, from which number the Governor of the State shall appoint one to fill the vacancy annually occurring in said Board. The term of office shall be five years. In case of resignation or removal from the State of any member of said board, or of a vacancy occurring from any cause, the Governor shall fill the vacancy by appointing a pharmacist from the names last submitted, to serve as a member of the board for the remainder of the term.

SEC. 6. The said board shall, within sixty (60) days after its appointment, meet and organize by the selection of a president and secretary from the number of its own members, who shall be elected for a term of one year, and shall perform the duties prescribed by the board. It shall be the duty of the board to examine all applications for registration, submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this act; to cause the prosecution of all persons violating its provisions; to report annually to the Governor and to the Minnesota State Pharmaceutical Association upon the condition of pharmacy in the State, which said report shall also furnish a record of the proceedings of the said board for the year, as well as the names of all pharmacists duly registered under this act. The board shall hold meetings for the examination of applicants for registration and transaction of such other business as shall pertain to its duties, at least once in three months, and the said board shall give thirty (30) days' public notice of the time and place of such meeting. The said Board shall also have power to make by-laws for the proper execution of its duties under this act, and shall keep a book of registration, in which shall be entered the names and places of business of all persons registered under this act, which registration book shall also contain such facts as such persons claim to justify their registration. Three members of said board shall constitute a quorum.

SEC. 7. Every person claiming the right of registration under this act, who shall, within three months after the passage of this act, forward to the Board of Pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of dispensing pharmacist on his own account in the State of Minnesota at the time of the passage of this act, as provided in Section 2, shall, upon the payment of the fee hereinafter mentioned, be granted a certificate of registration; provided, that in case of failure or neglect to register as herein specified, then such person shall, in order to be registered, comply with the requirements provided for registration as graduates in pharmacy or licentiates in pharmacy within the meaning of this act.

SEC. 8. Any person engaged in the position of assistant in a pharmacy at the time this act takes effect, not less than eighteen years of age, who shall have had at least three (3) years' practical experience in drug stores where the prescriptions of medical practitioners are compounded, and who shall furnish satisfactory evidence to that effect to the State Board of Pharmacy, shall upon making application for registration and upon payment to the secretary of said board of a fee of one dollar, within ninety (90) days after this act takes effect, be entitled to a certificate as registered assistant, which certificate shall entitle him to continue in such duties as clerk or assistant, but shall not entitle him to engage in business on his own account. Thereafter he shall pay annually to the said secretary the sum of fifty cents during the time he shall continue in such duties, in return for which sum he shall receive a renewal of said certificate *Provided*, any applicant who has had seven years' experience in compounding and dispensing medicines immediately prior to the passage of this act, may receive a certificate of a registered pharmacist.

SEC. 9. Every person claiming registration as a registered pharmacist under Section 7 of this act shall, before a certificate is granted, pay to the secretary of the State Board of Pharmacy the sum of two dollars, and a like sum shall be paid to said secretary by graduates in pharmacy and by such licentiates of other boards who shall apply for registration under this act; and every applicant for registration by examination shall pay to the said secretary the sum of five dollars before such examination be attempted; provided, that in case the applicant fails to sustain a satisfactory examination by the said board, the said five dollars shall be refunded to him.

SEC. 10. Every registered pharmacist, who desires to continue the practice of his profession, shall annually, during the time he shall continue such practice, on such date as the Board of Pharmacy may determine, pay to the secretary of said board a registration fee, the amount of which shall be fixed by the board, and which in no case shall exceed two dollars, in return for which payment he shall receive a renewal of said registration. Every certificate of registration and every renewal of such certificate shall be conspicuously exposed in the pharmacy to which it applies.

SEC. 11. The secretary of the Board of Pharmacy shall receive a salary which shall be determined by said board; he shall also receive his traveling and other expenses incurred in the performance of his official duties. The other members of said board shall receive the sum of five dollars for each day actually engaged in such service, and all the legitimate and necessary expenses incurred in attending the meetings of said board. Said expenses shall be paid from the fees and penalties received by said Board under the provisions of this act; and no part of the salary or other expenses of said board shall be paid out of the public treasury. All moneys received by said board, in excess of said allowances and other expenses hereinbefore provided for, shall be held by the Secretary of said Board as a special fund for meeting the expenses of said Board; said Secretary giving such bonds as the said board shall from time to time direct. The said Board shall, in its annual report to the Governor and to the Minnesota State Pharmaceutical Association, render an account of all moneys received and disbursed by them pursuant to this act.

SEC. 12. Any person not being or not having in his employ a registered pharmacist, within the full meaning of this act, who shall, after the expiration of ninety (90) days from the passage of this act, retail, compound or dispense medicines, or who shall take, use or exhibit the title of a registered pharmacist, shall for each and every such offense be liable to a penalty of fifty dollars. Any registered pharmacist or other person who shall permit the compounding and dispensing of prescriptions, or the vending of drugs medicines or poisons in his store or place of business, except under the supervision of a registered pharmacist, or except by a registered assistant, or any pharmacist or registered assistant, who, while continuing in business, shall fail or neglect to procure his annual registration, or any person who shall willfully make any false representation to procure registration for himself or any other person, or who shall violate any other provision of this act, shall for each and every such offense be liable to a penalty of fifty dollars; provided, that nothing in this act shall in any manner interfere with the business of any physician in regular practice, or prevent him from supplying to his patients such articles as may seem to him proper, nor with the making of proprietary medicine or medicines placed in sealed packages with the name of the contents and of the pharmacist or physician by whom prepared or compounded, nor prevent shopkeepers whose place of business is more than one mile from a drug or apothecary shop from dealing in and selling the commonly used medicines and poisons, if such medicines and poisons are put up by a registered pharmacist, or from dealing in and selling of patent or proprietary medicines, nor with the exclusive wholesale business of any dealers except as heretofore provided.

SEC. 13. Every proprietor or conductor of a drug store shall be held responsible for the quality of all drugs, chemicals and medicines sold or dispensed by him, except those sold in the original package of the manufacturer, and except those articles or preparations known as patent or proprietary medicines. Any person who shall knowingly, willfully or fraudulently falsify or adulterate, or cause to be falsified or adulterated, any drug or medicinal substance, or any preparation authorized or recognized by the pharmacopœia of the United States, or used or intended to be used in medical practice; or shall mix or cause to be mixed with any such drug or medicinal substance, any foreign or inert substance whatsoever for the purpose of destroying or weakening its medicinal power and effect, or of lessening its cost, and shall willfully, knowingly or fraudulently sell, or cause the same to be sold for medicinal purposes, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall pay a penalty not exceeding five hundred dollars, and shall forfeit to the State of Minnesota all articles so adulterated.

SEC. 14. No person shall sell at retail any poisons commonly recognized as such, and especially aconite, arsenic, belladonna, biniodide of mercury, carbolic acid, chloral hydrate, chloroform, conium, corrosive sublimate, creasote, croton oil, cyanide of potassium, digitalis, hydrocyanic acid, laudanum, morphine, nux vomica, oil of bitter almonds, oil tansy, opium, oxalic acid, strychnine, sugar of lead, sulphate of zinc, white precipitate, red precipitate, without affixing to the box, bottle, vessel, or package containing the same and to the wrapper or cover thereof, a label bearing the name "POISON" distinctly shown, together with the name and place of business of the seller; nor shall he deliver any of the said poisons to any person without satisfying himself that such poison is to be used for legitimate purposes; provided, that nothing herein contained shall apply to the dispensing of physicians' prescriptions specifying any of the poisons aforesaid. Any person failing to comply with the requirements of this section shall be deemed guilty of a misdemeanor, and shall be liable to a fine of not less than five dollars for each and every such omission.

SEC. 15. All suits for the recovery of the several penalties prescribed in this act, shall be prosecuted in the name of the State of Minnesota, in any court having jurisdiction; and it shall be the duty of the county attorney of the county wherein such offense is committed, to prosecute all persons violating the provisions of this act, upon proper complaint being made. All penalties collected under the provisions of this act shall inure one-half to the Board of Pharmacy, and the remainder to the school fund of the county in which the suit was prosecuted and judgment obtained.

SEC. 16. All acts or portions of acts regulating the practice of pharmacy and the sale of poisons, or the adulteration of drugs, within this State, enacted prior to the passage of this act, are hereby repealed; provided, that nothing in this act shall be so construed as to prevent any person who has once been a registered member, and may have forfeited his membership by non-payment of dues or fees, from renewing his membership within two years, by paying the required dues or fees, without examination.

SEC. 17. All persons registered under this act, shall be exempt from jury duty in the State of Minnesota.

SEC. 18. This act shall take effect and be in force from and after its passage.

NEW PENAL CODE OF THE STATE OF MINNESOTA.

SEC. 326. *Apothecary Omitting to Label Drugs, or Labeling them Wrongly.*—An apothecary or druggist, or a person employed as clerk or salesman by an apothecary or druggist, or otherwise carrying on business as a dealer in drugs or medicines, who, in putting up any drugs or medicines, or making up any prescription, or filling any order for drugs or medicines, willfully, negligently or ignorantly omits to label the same, or puts any untrue label, stamp or other designation of contents upon any box, bottle or other package containing a drug or medicine, or substitutes a different article for any article prescribed or ordered, or puts up a greater or less quantity of any article than that prescribed or ordered, or otherwise deviates from the terms of the prescription or order which he undertakes to follow, in consequence of which human life or health is endangered, is guilty of a misdemeanor.

SEC. 327. *Apothecary Selling Poison Without Recording the Sale.*—An apothecary or druggist, or a person employed as clerk or salesman by an apothecary or druggist, or otherwise carrying on business as a dealer in drugs or medicines, who sells or gives any poison or poisonous substance, without first recording in a book, to be kept for that purpose, the name and residence of the person receiving such poison, together with the kind and quantity of such poison received, and the name and residence of some person known to such dealer as a witness to the transaction, except upon the written order or prescription of some practicing physician whose name is attached to the order, is guilty of a misdemeanor.

SEC. 328. *Refusing to Exhibit Record.*—A person whose duty it is by the last section to keep a book for recording the sale or gift of poisons, who willfully refuses to permit any person to inspect said book upon reasonable demand made during ordinary business hours, is punishable by a fine not exceeding fifty dollars.

SEC. 329. *Selling Poison Without Label.*—A person who sells, gives away or disposes of any poison or poisonous substance, without attaching to the vial, box or parcel containing such poisonous substance, a label with the name and residence of such person, the word "poison," and the name of such poison, all written or printed thereon in plain and legible characters, is guilty of a misdemeanor.

SEC. 330. *Medical Prescriptions.*—No person employed in a drug store or apothecary shop, shall prepare a medical prescription unless he has served two years' apprenticeship in such a store or shop, or is graduate of a medical college or college of pharmacy, except under the direct supervision of some person possessing one of those qualifications; nor shall any proprietor or other person in charge of such store or shop permit any person not possessing such qualifications to prepare a medical prescription in his store or shop, except under such supervision. A person violating any provision of this section is guilty of a misdemeanor, punishable by a fine not exceeding one hundred dollars, or by imprisonment in the county jail not exceeding six months; and in case of death ensuing from such violation, the person offending is guilty of a felony, punishable by a fine not less than one thousand dollars nor more than five thousand dollars, or by imprisonment in the state prison not less than two years nor more than four years, or by both such fine and imprisonment.

SEC. 331. *Adulterating Food, Drugs, Liquors, etc.*—A person who, either

1. With intent that the same may be sold as unadulterated or undiluted, adulterates or dilutes wine, milk, distilled spirits, or malt liquor, or any drug, medicine, food or drink, for man or beast; or

2. Knowing that the same has been adulterated or diluted, offers for sale or sells the same, as unadulterated or undiluted, or without disclosing and informing the purchaser that the same has been adulterated or diluted, in a case where special provision has not been otherwise made by statute for the punishment of the offense;

Is guilty of a misdemeanor.

SEC. 332. *Disposing of Tainted Food.*—A person who, with the intent that the same may be used as food, drink, or medicine, sells, or offers or exposes for sale, any article whatever, which, to his knowledge, is tainted or spoiled, or for any cause unfit to be used as such food, drink or medicine, is guilty of a misdemeanor.

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Approved March 9, A. D., 1885; in force January 1, 1886.

REPORT OF THE COMMITTEE ON LEGISLATION ON PROPRIETARY MEDICINES.

To the American Pharmaceutical Association :

The resolution adopted at the last meeting directs us to report "upon the most feasible and suitable legislation to secure a sufficient statement of the composition of proprietary medicines to be put upon each package of the same, and upon the most favorable and efficient action to be taken by this Association in regard to the matter."

Legislation for a declaration of the constituents of medicines in the act of their sale, so far as the manufacture and sale of the medicines is not actually secured under patent right issued by the Patent Office at Washington according to acts of Congress, lies clearly within the legal province, not of Congress, but of the several States. Legislation by the several States is wholly competent to reach, and measurably to control, the conditions of the sale of medicines. The sale legally takes place in that State where the agreement of purchase is made. Legal conditions of sale of medicines enacted in one State and not in another State, would give rise to no more disturbance, on account of the disparity between States, than now arises in the commerce in kerosene and various other articles sold under different legal regulations in different States.* The laws of States already variously provide that in the sale of patent medicines or poisons, a certain statement of composition shall be put upon each package sold to the consumer. It is a measure of safety that the consumer shall have specified information of articles liable to prove hurtful to those destitute of such information.

All medicines, and articles used as such, concern the health of those who use them and put dependence upon them. By action or failure of action, a medicine is liable to prove hurtful when misapplied. Therefore it is the right of a purchaser of a medicine to receive information of its constituents, their names and proportional quantities. And it is a legitimate act of the State—so far as it deems expedient—to see to it that such information, in printed form, is placed upon each package of articles of medicine, as a condition of their legal sale.

Moreover, legislation requiring the composition of medicines to be given to the consumer is entirely in accord with the spirit of the institutions of the United States, because it is legislation tending to make the individual responsible for taking care of himself, and tending to secure him in the means of self-preservation. The purchaser of a medicine is provided with a record of its constituents, given in terms defined by published standards : now he may guide himself, in his own discretion or with professional aid, by the information given in the record of constituents, or he may neglect to so guide himself, and depend upon advice given on the wrapper of the medicine, in the exercise of his personal responsibility. The State has done its duty, and given the individual the opportunity for the exercise of discretion. The opportunity has an educational value to the individual.

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* Such, at least, is the opinion of your committee, after due consideration and legal inquiry. But it is proper to say that persons whose judgment is entitled to great respect among pharmacists, incline to believe that the obstacles interposed by inter-state commerce are very serious, and can best be met by action of Congress to regulate traffic in proprietary medicines between the States, as well as the importation of such medicines from foreign countries.

The matter of the names or kinds of names, in which medicinal constituents shall be stated, requires careful attention, but need not be allowed to embarrass legislation. Scientific nomenclature should not be demanded, but should be admitted ; and it should only be required that the names must be words which are defined, for simple or mixed articles, in dictionaries, pharmacopœias, dispensatories, and other general or professional authorities giving definition.

In undertaking legislation to publish constituents upon the labels of proprietary medicines, it is very desirable, whatever law be enacted, that it be given a gradual effect. Whenever privileges by sufferance are to be restricted, it is better that such privileges should be made to expire gradually by legal limitation. By this means a disturbance of values is avoided, and the business of the people preserves its level, without individual hardship from any action of the State. Three ways may be considered in which a progressive operation of the law may be sought for : (1) Medicines actually on sale at the time the law should take effect, to be registered and released from some portion of the full demands of the law. (2) Instead of registration, publication in public prints could be granted to medicines found in circulation when the law is enacted. (3) The law could be made to take effect at the expiration of one or more years after being enacted, without other means of gradual initiation of its results. In the form of a bill here submitted, the mode of registration first above named is adopted.

Regarding medicines which are secured under patent right, according to acts of Congress, it is clear that Congress has the right to require a declaration of constituents of such medicines to be plainly placed on their labels. All compositions of matter under patent right are now to be recorded in the Patent Office and published in its reports, in order that the benefit of the invention may ultimately revert to the public. Compositions of matter patented for medicinal use may very properly be required, in addition, to give statement of composition in printed form in each act of sale, as a measure of security against error and misapplication in use.

A form of a State law is appended to this report—together with a condensed summary of the features so embodied. Your committee are agreed in presenting this form of a bill, but they desire it fully understood that it is offered only by way of suggestion, and as aid in defining the opinions of such as may be engaged in preparing for legislation in this matter.

If it were necessary to justify the interest of this Association in this subject, it could be said that, while pharmacists are not to judge upon the choice of medicinal agents made by the public, they do have custody of statements and records of the composition of medicines. Therefore it is quite proper that this Association should be heard on questions of secret composition of medicines, from time to time, as it has been heard in the past.

In respect to "the most favorable and efficient action to be taken by this Association in regard to this matter," your committee have only to recommend the adoption, at this time, of the following resolution:

Resolved, That it is the deliberate opinion of this Association that the labels of proprietary medicines ought to carry a statement of their constituents.

ALBERT B. PRESCOTT,
FRED. HOFFMANN,
CHARLES RICE.

AN ACT TO REGULATE THE SALE OF PROPRIETARY MEDICINES.

1. Registration of Proprietary Medicines up to December 31, 1885.

Any person being a resident of this State, whether manufacturer or authorized agent of the manufacturer of any proprietary medicine as defined in Section 10 of this act, may register the name or title of such proprietary medicine in the office of the State Board of Health, on or before December 31, 1885. Such registration shall be made upon a form or blank provided, on or before October 1, 1885, by the State Board of Health, and the statement made therein shall be duly verified, by oath or affirmation, before any notary public or other officer of the State authorized to administer oaths or affirmations.

2. Duties of the State Board of Health in the Matter.

It shall be the duty of the State Board of Health to provide blanks, as described in Section 1 of this act, and to prepare and keep an official register of all proprietary medicines that may be offered for registration, in compliance with Section 1 of this act, on or before December 31, 1885, and the said Board is authorized to establish a registration fee which shall in no case exceed the sum of five dollars.

3. Proclamation by State Board of Health, of List of Potent Substances.

The State Board of Health is hereby authorized and directed to prepare and proclaim, from time to time, a list or lists of "Potent Substances" which shall include all such substances, for internal and external use, which in the judgment of the Board have an energetic or potent action, and which, if improperly or carelessly used, or used without their quantity, proportion or strength being known, may produce dangerous results. This list may be revised, augmented and amended from time to time, and shall be published at least once, as originally adapted or as amended from time to time, in one of the daily papers of the City of New York*, and copies of the list shall be kept on file in the office of the Board, which copies may be sold to applicants for a fee to be established by the Board.

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* Or whatever other city may be selected, or in some official paper.

4. Enumeration of all Constituents on Label.

All proprietary medicines, which have not been registered on or before December 31, 1885, as provided in Section 1 of this act, and whether the manufacturer or authorized agent of the manufacturer of such medicines be a resident of this State or not, if such medicines shall, after that date, be offered or exposed for sale, sold, bartered, exchanged or given away within this State, they shall bear upon their several labels, in legible English type, the common or scientific names of every constituent drug entering into their composition.

5. Enumeration of Potent Substances with Quantity of Same on Label.

No proprietary medicine, whether the same have been registered in compliance with Section 1 or not, and which shall contain any of the articles included in the list of "Potent Substances" proclaimed by the State Board of Health, shall be offered or exposed for sale, sold, bartered, exchanged or given away, within this State, from and after May 1, 1886, unless the same bear upon its labels in legible English type, the common or scientific name of every potent substance, as defined in Section 3 of this act, which may be a constituent—together with the quantity, by weight or measure, intended by the manufacturer to be contained in a definite weight or volume of the proprietary medicine, so that the proportions which the potent substance or substances bear, in weight or volume, to the whole mixture or compound, or to a definite dose or definite weight or volume of the latter, may be readily ascertained.

6. Penalties.

Any person who shall offer or expose for sale, sell, barter, exchange or give away, within this State, from and after May 1, 1886, any proprietary medicine, within the meaning of this act, which shall not comply with the provisions of sections 4 and 5 of this act, shall be guilty of a misdemeanor, and, on conviction, be punished with a fine not exceeding . . . dollars, or with imprisonment not exceeding . . . days, or with both, in the discretion of the court.

7. Penalties.

Any person who shall knowingly make a false statement or representation on his application for registration to the State Board of Health, and any person who shall attempt to evade the provisions of this act, by omitting ingredients in the enumeration of the constituents upon the label of any proprietary medicine, or who shall name other than those contained therein, or who shall employ any of the potent substances, defined in section 3 of this act, in any proprietary medicine, in larger proportions than is indicated upon the labels, shall be guilty of a misdemeanor, and on conviction shall be punished . . . (as before).

8. Mode of Prosecution.

All prosecutions under this act shall be conducted by the public prosecuting officer of the county in which the offence may have been committed, upon the complaint of the State Board of Health or any sanitary authority or officer, or any licensed practitioner of medicine within the State. The fines collected shall be paid into the treasury of the county in which the conviction may be had.

9. Definition of Term.

The term "common or scientific name," wherever it occurs in this act, shall be held to denote only such names as are in common and general use among the English speaking people, or are the recognized scientific names, and which do not themselves denote any secret, private or proprietary mixture, substance, product or compound

10. Definition of Term.

The term "proprietary medicine," wherever it occurs in this act, shall be held to denote all medicinal preparations, simple or compound, for internal or external use, which are offered for sale, or sold, or claimed, as the exclusive invention, discovery, or product of a special manufacturer, person, firm, or corporation, or which are designated by a special name or title not recognized by any national pharmacopœia or dispensatory, or by the pharmacopœia or dispensatory of any particular school of medicine.

11. Exemptions.

This act shall not apply to any simple or compound medicines prepared or dispensed by pharmacists upon the written prescription of a legally qualified physician, nor to those for which standard formulæ are given in any national pharmacopœia or dispensatory, or the pharmacopœia or dispensatory of any particular school of medicine. But a reference to such authority shall be given on the label.

12. Date of Going into Effect.

This act shall take effect immediately.

SPECIAL REPORTS AND ESSAYS.

I. PHARMACY.

PHARMACEUTICAL STEAM BOILER.—CORRECTION.*

BY E. L. PATCH.

In the Report on the Progress of Pharmacy, Proceedings for 1884, page 45, under the section "Economy," it is said: "In *eight* hours this boiler will, with the still shown, give *sixteen* gallons of distilled water at the cost of a gallon of oil."

This is a wrong statement originally appearing in the Journal quoted. As soon as it appeared in print great diligence was exercised to have it corrected and made to read "In *ten* hours, etc.," and "*five gallons*," but without avail. That no one may be misled, note, if you please, this correction.

PERCOLATION—EXPERIMENTS AND ANSWERS TO CRITICISMS.†

BY NATHAN ROSENWASSER, CLEVELAND, O.

Criticism, intended to provoke discussion, or in any way to increase our knowledge, I cheerfully accept and cordially invite. The American Pharmaceutical Association is too seriously occupied with pure and lofty purposes to be diverted from the pursuit of knowledge by personal abuse, foreign to the scientific drift of the subject. The criticisms of Dr. Cummings, of Portland, Me., read at our last meeting, I only answer so far as they are of scientific interest and value: the lengthy abuse—coming from an old member of this Association, whom I never saw and do not know—I am totally at a loss to account for.

I find myself charged with not "defining" SOLUTION, but since an accurate description of solution is its own definition and he acquiesces to *my description* as being correct, this charge fails to stand.

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* Read at the Fourth Session.

† Read in abstract at the Fourth Session.

Next, I am charged with a mathematical error in calculating the ratio of surface contacts: to this I plead guilty; though it in no wise alters the argument I made, nor the standpoint I took—nevertheless, I am very thankful for the correction. My caustic critic must, in criticising others, not fall into worse errors himself, else he might verify the adage, "He laughs best who laughs last."

The Doctor next scoffs at Prof. Lloyd's admirably formulated *Law of Contacts*. Says he, "We must take Prof. Lloyd to task for surprising us with an equally extraordinary calculation of contacts, to *realize* which in our way of viewing it, would require a percolator 25 *miles long and* $\frac{1}{16}$ *part of an inch in diameter*." It is not possible that our critic is especially gifted with a head so elongated as to conceive of a percolator 25 miles long, yet sheltering so narrow a mind as to be capable of grasping within it a measurement of the $\frac{1}{16}$ part of an inch!

Referring to the article, I challenge our critic to show how such an inference can be possible in practice. Prof. Lloyd simply demonstrated that with the same weight of drug, and the same quantity of menstruum to percolate with, the narrower the percolator, the better was found to be the exhaustion. This he demonstrated in theory first, then in practice. While Prof. Diehl describes the same results exactly, in the same volume (Proceedings A. P. A., 1879), still the credit of formulating the *Law of Contacts* belongs to Prof. Lloyd. Though we must agree with the practical application of this law, we must warn our critic not to proceed to a "reductio ad absurdum." While a narrow percolator is preferable to a wider one for percolating a given quantity of drug, *in practice* we will find a length of percolator reached that, with a given quantity of menstruum, *must practically exhaust;* to increase the length of the column of drug still further, by using a far narrower percolator, would be useless in practice, however beautiful in theory. Therefore, our critic must not interpret Lloyd's Law of Contacts to go beyond practicability. With a full knowledge of this admirable law—and the best of intentions—even as great an authority as the Chicago College of Pharmacy, and as able a man as Prof. Oldberg, tabulates a series of percolators, in lengths varying from (5) five inches to (30) thirty, and in diameters from (1) one to (6) six inches. They seem to fall into the error that percolators should be about six times as long as they are wide! They would have us percolate one ounce in a six inch high percolator, while a pound is treated perhaps to twenty inches of height! Each minim of menstruum in the smaller percolator has only six inches of molecules to come in contact with in its downward flow, while each minim in the other case has twenty inches of molecules, one above the other, to pass, in percolating through. Is then, the fluid extract from the ounce less valuable than that from the pound, that it needs less contact with successive parts of the drug? Certainly, the directions for proceeding are supposed to be the same, all conditions being alike to both percolators; the difference in height must result in a disturbance of conditions and variance in result. The College has made a mistake by interpreting the law of contacts as referring only to diameter, whereas it refers only to *lengths*, and might be stated thus:

1. *The quality of any fixed amount of percolate is dependent upon the length of the column of drug in the percolator; packing and other things being equal, the longer the column the better the quality.*

2. Two or more percolators of different diameters and capacities, having columns of the same drug under like conditions of length, fineness, pressure, etc., and percolating under relatively the same conditions, should yield, in equivalent quantities of percolates, extracts of the same strength, *irrespective of the quantity of drug contained in each percolator*. A percolator 10 feet high and 3 inches diameter, would thus yield as good a fluid extract as one 10 feet high and 10 feet diameter. Experiments I made, that help to verify this view, are detailed later on.

Let us follow our reviewer: "Another awkward expression," he adds, is the following: "The reduction in temperature produces, in some instances, a return to the solid part of the solution." This is only a printer's omission, Mr. Critic: the *original* pamphlet reads "a return to the solid *of* part of the solution."

Our careful critic next misquotes me by leaving out an important word, and then waxes warm in his war against the windmills of his own creation; hurling French and German authors at them, till they must of course surrender! Had I said "Percolation is not a process of displacement," instead of what I *did* say, and repeatedly too, "Percolation is not a *simple* process of displacement," the many pages devoted to criticising his own mistake would not have been in vain. The fact is, I divided percolation into two somewhat different kinds, displacement or simple percolation, and cellular or osmodic percolation, which is complex.

After exhausting all imaginable authorities concerning gas molecules, red and green colored rings, electro-capillary currents, and other remote subjects not at all to the point, our well-read critic suddenly believes he has convinced his readers, and says: "How osmosis deprives percolation of its title to be regarded as a process of displacement, we fail to see." Why, Doctor, neither did I see it, over three years ago, when my paper first appeared!

Next, we find ourselves disputed regarding the *absolute* exhaustion of drugs in cell percolation. The Doctor says it *can*, and I say it *cannot* be done. He advances the theory that, as liquid molecules are small enough to penetrate the cells, ultimately absolute exhaustion must ensue. However, he believes also in this exhaustion taking place by osmosis. It must, then, be a new kind of osmosis that can abstract a fluid from the cell, without new fluid entering to force the one out, also instantly more or less mingling with it, thus always preventing absolute exhaustion, however infinitesimal the amount of original fluid remaining. A figure in mathematics can always be found to express such a minute division, in spite of our belief in ultimately reaching the atom. True, all of this has little, if anything, to do with the propositions for *practical percolation* which I laid down three years ago.

Next, our critic disbelieves that alcohol contracts, while water expands, vegetable cells. He says, "If the cell walls are *physically* or chemically affected by the menstruum, no osmosis results." In other words, if alcohol or water physically affects the cells or their walls, no osmosis is possible. As, however, he believes osmosis does take place, he disbelieves that the cells expand or contract. However, later on, he wishes to ascribe the expansion of the cells, to their "*filling up*," by osmosis. Thus his admission contradicts his denial, and, in fact, neither proposition is very tenable; for, if the expansion takes place by *filling up of osmosis*, osmosis must cease when the cells, being filled thereby, expand their walls; for he says, "No osmosis results if the cell walls are physically altered."

Wishing to demonstrate my assertion as correct or incorrect, I had two specimens prepared, one a thin shaving of white wood from a carpenter shop, the other one of rhubarb root, and placed them under a microscope magnifying 600 diameters. I carefully observed the size of the cells and cell walls, both before and after moistening with water as well as alcohol. The result was quite marked, contraction upon addition of alcohol taking place instantly, while upon the addition of water expansion took place, only a trifle slower. Having no micrometer attachment, I was unable to measure the expansion and contraction, but perhaps the colleges, who are better equipped for further investigation, could enlarge upon and furnish statistics. A diminution in volume of one dimension might have been accompanied by increase of another, but I did not observe any. A piece of rhubarb or other drug of definite size might be immersed in alcohol or water, and any change observed, but a shrinkage or expansion might be said to be produced by a contraction or expansion of the pores and not the cell substance.

I find next, my critic "up in arms," at what he calls my attack upon the Pharmacopœia in 1870. I hope I will never be found disrespectful toward any man or body of men, especially the chosen representatives of many of our best institutions of learning, as are our Pharmacopœia Committee; but let us not forget that the results of their deliberations are *open* to criticism—the severer the test, the better for the cause. The Pharmacopœia is not intended as an awe-inspiring work, that should be bowed down before and worshipped as the Hindoo does his idol. On the contrary, it is the duty of all to unite in one common effort to purge it of imperfection, to improve our standard authority, so that when the next committee meets they will be able to present us with a revision that will pay well for all our criticism and suggestions.

The next point of any importance he attacks is, my suggestion to moisten the drug with the *least* amount of menstruum, reserving the rest for percolation in fractions, at short intervals, thus producing alternate maceration and percolation, as the percolation proceeds lower and lower. While I have not as yet compared this plan, in the experiments given below, with the plan of the U. S. P., of allowing the drug to be well moistened, then, after packing adding menstruum till the liquid begins to drop and the surface is covered, then in this condition macerating for 24 hours, yet in the experiments detailed below, I at least demonstrate the *practicability* of the process I suggested, which, since it saves at least 24 hours time, lost in maceration, is sufficient said in its favor, to say nothing of the part which the U. S. P. loses by evaporation. Summing up my paper, our critic fails to understand Canon 5—"All percolations should be practically a succession of macerations, and should be either *slow* and continuous, or interrupted for short periods, and then admitting of a greater rapidity of flow."

Says our critic, "percolation in our view, keeps the menstruum in motion, maceration keeps it stagnant or quiescent." Why I have advocated *slow* percolation is to approximate as nearly as possible to maceration, in which osmosis predominates; thus I desire to secure all the osmosis I can while percolating. Furthermore I secure it by stopping the flow occasionally, or by pouring on the menstruum in parts at intervals sufficient to *ensure* maceration as the liquid proceeds. Our critic also believes that the Pharmacopœia Committee adjusted the fineness of powder to the structure of the drug and the menstruum was adjusted to suit the powder! He believes they are right and I am wrong in claiming that the fineness of the powder should be adjusted to the menstruum — coarser if the menstruum is aqueous, finer if alcoholic. We select the menstruum for its solvent action on the medicinal matter in the drug, and its utility in being thus administered. These are of primary importance compared to the structure of the drug, which mechanism can adjust to any fineness.

The information (?) our critic received from Mr. Berry, regarding the pressure exerted by the liquid within a pressure percolator, as equal to 32 *pounds to the square inch*, is quite valuable if not also novel. Engineers claim less than ½ pound pressure per square inch for every foot of a column of water in height, or at most, 4 to 5 pounds to the usual length of 8 to 10 feet of elevation. Perhaps the Doctor refers to his percolator 25 miles high? Or does Mr. Berry claim the invention? The criticisms of our friend, so far as they are of even the slightest value or interest to pharmacy, end here; and while I have felt compelled to answer them, for fear that they might mislead, I dismiss them gladly, without further comment.

EXPERIMENTS.

The experimental work thus far undertaken by me in support of the views expressed in this paper, are not of a great *variety*, yet will sufficiently prove a number of theories and be the means of guiding those who desire to attain *more perfect work*, a step nearer the light.

Experiment 1.—Simple or Displacement Percolation.

A and *B*, 2 percolators, each 20 inches long, cylindrical throughout. *A* is about 1 inch in diameter, *B* is about 2¼ inches wide.

The volume of liquid containable in *A* is just ⅕ the capacity of *B*. Each inch in height in *A* contained 384 minims, and in *B* 2 fluid ounces. If, into *B*, I pour 2 fluid ounces of liquid, it will, to occupy the same height in *A*, be necessary to pour in 384 minims (⅕ of 2 fluid ounces), or if I pour ½ fluid ounce into *A*, I must always put 5 times that much into *B*, to keep up the same relative volumes in both. If I take a fine powder and introduce it into the percolator *A*, five (5) times its weight would, under like pressure and other conditions, occupy the same height in the other, *B*.

Into *A* fine sand was introduced to the height of 15 inches, weighed, and sand 5 times its weight was taken and reserved for *B*. The sand from *A* was moistened with 5 fluid drachms of salt solution (representing 128 grs. salt in each fluid ounce). It was again introduced and shaken down to 15 inches height. The sand for *B* (5 times that of *A*) was moistened with 25 fluid drachms of the same salt solution, and also shaken down to 15 inches height in *B*.

Into both *A* and *B* distilled water was next poured, in quantity representing 1 inch in height of each, or 384 minims into *A*, and 2 fluid ounces into *B*. This was repeated, always simultaneously, every twenty minutes.

First Result.—Liquid started to drop from *A* only 10 seconds later than from *B*, and, quite satisfactory if not remarkable, the rate of flow was also in the ratio of 1 to 5, or one drachm from *A* passing while 5 fluid drachms passed from *B*.

Second Observation.—It will be remembered the salt solution was only used to moisten the sand; after packing, *only distilled water was used to displace with.* To see whether the distilled water would wholly or only partly force the salt solution downward, the first 5 and 25 fluid drachms respectively of the percolates (being equivalent to the whole amount of the salt solutions used to moisten the sand in *A* and *B*) were reserved, and two fluid drachms of each evaporated to dryness. Thirty grains out of a possible 32 were obtained from *A*, and 29 grains from *B*. The next 5 and 25 fluid drachms yielded for *A* 1½, and for *B* 3 grains. The whole of the salt solution may from this be considered to be practically displaced. The loss being more likely due to the slight diffusion resulting at the surfaces of distilled water and salt solution, and slightly from the partial adherence of salt solution to the particles of sand. We will reserve our conclusions till later.

Experiment No. 2.—Cell Percolation.

Percolators *A* and *B* were taken as before.

Ground mandrake root, passed through a No. 20 sieve and then moistened with 2½ fluid ounces of alcohol to 18 troy ounces of ground drug; 18 troy ounces of drug, thus moistened, occupying 18 inches in *B*, while 3⅗ troy ounces (⅕ of 18) occupied the same height under about the same pressure, in percolator *A*. Alcohol was added simultaneously, ½ fluid ounce to *A*, and 2½ fluid ounces to *B*, half hourly, without previous maceration.

The liquid from *A*, beginning to drop almost 5 minutes before it did from *B*, the rate of flow was again very nearly as 1 is to 5, *A* dropping a very trifle faster in proportion than *B*.

Collecting the respective fluid extracts from each, 3⅗ fluid ounces of each were evaporated to dryness, and residue weighed. That from *A* yielded 137 grains, that from *B* 134 grains.

Long before the last of the above percolate from each was collected, a few drops from each percolator were allowed to drop into water, and producing no cloudiness (absence of more than a trace of podophyllin), I considered, therefore, *practical exhaustion* complete, by the time *only four-fifths of the requisite quantity of percolate to make a minim for grain fluid extract had dropped through.* The time taken was only six and one-half hours, through 18 inches height of drug, to completion of the fluid extract.

Conclusions to be derived from experiments Nos. 1 and 2, are:

1st. The rate of flow in percolators of equal height under like conditions should be in proportion to the capacity of the percolator, i. e., the surface area, or for cylindrical ones, the relative squares of their diameters.

2d. The amount of menstruum poured on in percolators of equal height under like conditions of pressure, height of drug, etc., must be proportionate to the surface area, etc.

3d. The *quality* of exhaustion or percolate, is equal for equal heights of the same drug in percolators *irrespective of diameters*, provided the rate of flow is proportional, and packing and menstruum are the same.

4th. By a process of alternate percolation and maceration at short intervals, it is possible to exhaust practically within from 6 to 12 hours and obtain a minim for grain fluid extract, provided the percolator is of sufficient length, without evaporation of part of the percolate.

5th. A length of about 20 inches is practicable, and likely sufficient, but it is equally as necessary in percolating an ounce as it is for a pound of the same drug under like conditions.

REMARKS.

In making tinctures and weak percolates, a percolator need not be filled to such a height as in making fluid extracts, and the ordinary percolators of the market will answer. In making fluid extracts, what is lost in height, it must not be forgotten, can be made up by a slower rate of flow. Dr. Squibb describes an almost perfect percolate obtained by dropping at rate of 4 drops in 24 hours, perhaps, in a wide and short percolator, but apparently was overlooking the cause and effect of this experiment. See Proceed. Am. Ph. As., '78, p. 745.

If it is found that a percolator 2 inches square and 30 inches high will exhaust at the rate of 5 minims per minute, one 6 feet square and 30 inches high, will admit of a rate of flow of 7730 minims per minute, or over 1 pint, and be equally as thoroughly exhausted. Prof. Diehl (Proceed. Am. Ph. Assoc., 1878, p. 693), limits the rate of flow to not more than 1 fluid drachm per minute, saying nothing about the rate being proportionate to quantity, height or area of surface. Dr. Squibb suggests the rate of flow to be proportionate to the quantity of fluid extract to be obtained, and the time of 24 hours in which to collect his first percolate. (See Am. Ph. Assoc. Proceed., 1878, p. 741.)

He makes no discrimination for height of powder or diameter of the percolator. Perhaps the reason of his failure with quantities less than 4 troy ounces of drug, is that he has not observed the necessary relation of height to percolate, *not* observing that he gets more height with larger quantities, and therefore, better results. Perhaps, too, we can consider the process of repercolation as almost equivalent to one with a long percolator, in which the separate percolators are but sections of the one, with these differences—the reserved portions do not wash their way through the other sections, as they must do in a long percolator; and even the washings are collected in lots, and then passed through, whereas in the long percolator each consecutive layer of menstrumn washes the last part better, without mingling with weaker percolate above it, and being washed all in a body. I believe a comparison of repercolation in 4 percolators of total height of drug equivalent to that in one long one, will result *in favor of the long percolator*, other things being equal.

When my paper, A Study of Percolation, was presented at the meeting three years ago, it was supposed by the writer that percolation was a subject of such universal interest to Pharmacy that much valuable discussion and knowledge would be elicited from those whose experience would justify them, opposing new ideas as compared with old ones, if indeed, experience would warrant them in having *set* opinions. It was my first experience at a meeting of the American Pharmaceutical Association. I saw professors of pharmaceutical schools rise in indignation at this attack upon the old established forms; and without offering an argument in defense or attempting to see if the logic of the new theories was assailable, or the old grounds could be defended—a motion was rushed through, checking all debate and discussion of this subject. Yet the next day, these very same men I saw vaunt their appreciation of the subject of percolation as first in importance in Pharmacy! Said one, indirectly attacking my article when it was not the one up for discussion, "The subject is saddled by an immense amount of theory, when there is very little given in the way of direct operative experiment." Is it so very necessary to clear understanding, that I put into one hand two marbles, and then into the other two more, so that one can by "*operative experiment*" be sure to have *four* marbles together? Must each proposition based on well-known laws, be practically demonstrated *first*, before one is willing to confess it does look something like logic? If so, poor Pharmacy! she is far behind her sister professions. Meeting me, the same day, before a large number of visitors, one of the professors of one of the schools of Pharmacy said, "Young man, you are all wrong, your views of percolation are decidedly wrong! Why, don't you know, you must first expand the cells before they can be percolated? If you press your drug into a small compass you hinder this, and so you cannot succeed." When I answered, "How about the Pharmacopœia directing the use of *pure alcohol* for some percolations, which still farther contracts these cells, which you say must first be expanded?" he said no more.

TWO OR THREE PHARMACEUTICAL NOTES.*

BY H. T. CUMMINGS, M. D., PORTLAND, MAINE.

Referring to Mr. Hallberg's paper, presented to the Association in 1884, we find the following:—"As an illustration serving to prove the correctness of this observation, we may mention the fluid extract of ergot. According to the best of authorities, as well as our own experience with the drug, the alcoholic strength of the menstruum for the fluid extract should not exceed that of 40 per cent., as all the desirable active principles of the drug are soluble therein, whereas the solubility of part of the medicinally valuable constituent is modified in the alcohol above this strength. On the other hand, the preparation made with 40 per cent. alcohol will after a short time show signs of precipitation, which will continue for a period of about three months. This precipitate will be found to consist of a modified form of the fixed oil, which having been extracted along with the active matter, is subsequently owing probably to resinification caused by the watery menstruum, gradually rendered insoluble."

The point to which attention is invited in this quotation is, why not get rid of the fixed oil before percolating for the preparation?

According to Prof. Procter's views, this fixed oil holds in solution but a trifling fraction, if any at all, of the active constituents of the ergot. By those who have paid any attention to the matter, its presence is considered as a nuisance, whether in the entire drug or its powder. or its preparations. The German Pharmacopœia seems to have recognized this first, and, as I have understood, has directed a preliminary percolation of the powdered drug with ether, to remove it.

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* Presented at the Fourth Session.

Petroleum naphtha, otherwise called benzine and chain lightning in this part of the country, has more than once been suggested as a proper agent to effect this removal, and it would seem to be preferable to ether, as less likely to carry off more or less of the active matter from the drug, besides being far less expensive. A very good illustration of its utility is presented in a paper by Prof. Remington in the Proceedings for 1873. Here a quantity of buchu was subjected to its action, which resulted in the extraction of the volatile oil and resin without any portion of the principles which produce diuretic action, and when the same lot was percolated afterwards with alcohol, the tincture thus made produced active diuresis.

Impressed with these ideas, some three years ago, having an opportunity to prepare some *fluid extract of ergot* for a friend, the writer determined to try the effect of dissolving out the fixed oil from the drug as a preliminary step in the operation. The drug was subjected to the action of a hundred-pound pestle for half an hour, when it was believed to be sufficiently comminuted for the action of the benzine. It was packed in an ordinary glass funnel, and the menstruum poured upon it and allowed to percolate without previous maceration. The benzine ran through the drug, carrying with it the greater part of the oil. The mass was removed from the funnel, and spread out on a cloth in the open air and sunshine, to promote the escape of the benzine by evaporation. The change in the color of the powder seemed remarkable. From a deep chestnut brown, the color seemed of a black ground, thickly spangled with minute silvery white particles, giving it a silvery gray appearance. A portion of the drug which when in the funnel was near the point or throat, was still loaded with the oil. This was carefully separated and treated anew with the benzine, and when washed clean was united with the rest. Twenty-four hours' suspension over a stove drove off every trace of the coal oil odor, and the drug was found in fine sand-like powder, in good condition for percolation, and apparently would prove as stable in the shop bottle as rhubarb or ipecac.

As this operation had been performed nearly, if not quite, a year before the Pharmacopœia of 1880 was issued, the formula for fluid extract of 1870 was necessarily employed. This was executed in due form, and the result was a clear, handsome preparation, which compared well with any fluid extract from any of the best manufacturing houses. I had two or three opportunities of examining it this summer, my friend apparently forgetting that he had a reliable extract made on his own premises, and ordering several pounds from drummers, which he and his clerks used in prescriptions—so I fortunately could observe its quality as to stability. After a lapse of three years and more, it had begun to cloud a little, a scanty deposit was formed on the bottle, but further than this there was no precipitation, and the taste had not changed. This experiment would seem to show that the fixed oil of ergot is of no use in the preparation, but is rather a hindrance to its successful manufacture.

In writing to Prof. Lloyd on this subject, he in reply informed me that he had practiced this for some time, that the fluid extract gave the greatest satisfaction to his customers, and that there is a demand for the oil of ergot; but did not inform me for what it is utilized.

Another occurrence in my experience would serve to exhibit the value of petroleum benzine as a depurator of drugs. I had a lot of about ten pounds of *opium* sent to me to powder. Having sliced it up, put it into my drying-closet, and kept it there two or three days, I put it into the mortar, and attempted to powder it. I knocked out a few ounces of fine powder, but the greater part of it clung to the pestle in a tenacious mass. I cleaned it off and returned it to the closet for another day or two. A second trial resulted about the same as the first. Again it was returned to the closet, and after a third and still more unsatisfactory trial I examined the drug. It was soft and tenacious, and appeared not to have dried at all since I put it in at first. I took a small portion and washed it with the benzine, when lo! out came a fine, handsome powder. This lot of opium was loaded with caoutchoucoid matter, and, on thinking the matter over afterwards, I asked myself if it had not been adulterated, though the idea did not occur to me at the time. The friend who gave me the job did not like to submit to the loss which would have accrued had I washed out the caoutchouc, and I returned the opium to him with about a pound of fine powder which I had succeeded in knocking out of it.

Another point, upon which I believe Mr. Hallberg is mistaken, is his estimate of the *volume of* such *drugs* as buchu, senna, arnica flowers and such, as compared with ergot, rhubarb, aconite, etc. When buchu, senna and arnica flowers are *powdered* sufficiently fine to fall through a 40 mesh sieve, they are condensed, and their volume bears a more equal relation to their mass than when they are merely beaten up in a mortar. The specific gravity of these drugs is so low that I never could get them to fall through the mesh of a sieve finer than 40; they are sure to clog it. His estimate may be correct, taking them when coarsely bruised, but in fine powder their volume is very much diminished—diminished to an amount which surprised me when I first tried the experiment. I should not regard them as possessing a volume of 150 to 100, much less 300 to 100, as compared with drugs of denser structure. It is probable they might possess more of the sponge faculty, owing to their comparatively loose structure, and so absorb more menstruum in proportion to their volume than drugs of a dense structure.

I had occasion recently to determine the *specific gravity* of two liquids, and, not having a specific gravity bottle, I had recourse to a method which I have never seen laid down in books, though it may have been employed long ago. Two micro-chemical flasks, one holding ¾ and the other ½ of a fluid ounce, were accurately counterpoised by the help of paper pill boxes and flaxseed. Ten cubic centimetres of each liquid were measured into the two flasks, from an accurately graduated pipette. These were placed on the scale and weighed to the nearest centigram. The weights were 10.26 and 9.83 grams respectively. Now, as 1 cubic centimetre of water weighs 1 gram, if we divide by 10 we have, moving the decimal point one place to the left, 1.026 and 0.983, which gives us the specific gravity correct to the third decimal; and, if the balance is sensitive to a milligram, it will give the specific gravity to the fourth decimal.

The "Druggists' Circular" and the "Pharmaceutical Record" have both copied from the "American Bottler," Mr. Kilmer's paper on *Pure Water* "for Bottlers' Use." Prof. Bedford thinks this is a good thing which the bottlers should not monopolize, and in this he is right. Leaving the members of the Association to study the article at their leisure, I allude to it merely to recount my own experience. I prepared a solution of ordinary alum, of the strength of 5 centigrammes to 1 cubic centimetre. This required 50 grams to the litre, the quantity I prepared. My first experiment was with some water, foul-smelling and rather dark colored, drawn from the bottom of a cistern. There was two quarts of it, and I employed 20 cubic centimetres of the alum solution. In twenty-four hours the water was bright, clear, and free from odor, and was iced and used at the dinner table. Those who do not possess litre flasks and gram weights can make the solution of the same strength as above, within a very small fraction, by dissolving 1½ troy ounces of alum in 32 fluid ounces of water. If care is used not to employ an excess of the solution, the alum, as Mr. Kilmer says, combining with the organic and mineral impurities in the water, is carried down with them. The water is next to distilled water for purity, and can be obtained in no other way so easily.

PRECIPITATES IN FLUID EXTRACTS.[*]

Continued from page 419, Proceedings A. P. A., 1884.

BY J. U. LLOYD.

The influence of capillarity upon certain solutions during their passage through bibulous paper having been illustrated in the immediately preceding portion of this communication (presented last year), I am led in continuation to introduce another phase of the subject.

Before proceeding, however, I wish to acknowledge the courtesies extended me by several gentlemen who have been sufficiently interested in the subject to either correspond with me direct, or to refer in print to my previous papers; and particularly do I value the references of Mr. Hans M. Wilder, as given in the American Journal of Pharmacy, 1884, p. 508.

I may also add that the heading of this paper seems scarcely pertinent to the substance, and that some may argue that the title might with advantage be changed. If I am permitted to pursue the subject to the end, however, I think it will be found that the entire subject of the extraction of the soluble matters from plants and the preservation of the liquid products is here involved, and that the heading, therefore, is not inappropriate.

The feature of my last paper that seemed liable to prove fallacious—the disintegration of a solution by means of the capillary action of a passive material such as filter paper or wood pulp—having been allowed, others having made observations somewhat similar to my own, I shall pass to the next step.

In reviewing the phenomena presented in that paper, the following query presents itself. Although it is true that the passing of a solution through a column of fibrous paper by capillarity, will separate many substances from the liquid in the beginning of its passage, will this effect follow the saturation of a passive capillary body submerged in a solution? In my opinion we are all familiar with facts that support the idea of a separation under these conditions.[†] The familiar illustrations, to which I think we can all refer, are the spent liquids of the dyer. However, in order to produce positive evidence, precluding the use of mordants that

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The author expresses his thanks to Prof. Robt. B. Warder, for assistance in both the detail work of the experiments and in the calculations.

[*] Read at the third session.

[†] If I mistake not, I once glanced over a paper that was somewhat in the line of a part of my own investigations, but which is not now at my command. This paper it seems to me spoke of the absorbing power of paper pulp in liquids that contain salts. I neglected to record it, and cannot find it by any title that I would suppose applicable to the subject.

act chemically, I call to your attention a series of experiments wherein chemically pure white filter paper was employed in connection with alkaloidal salts and vegetable and mineral acids and water.

Solutions were made separately of these different substances and (having reserved a portion of each) a package of four-inch paper was placed in each solution, and when saturated was at once removed.

The liquids remaining after the removal of the saturated paper were then examined by appropriate methods, and at the same time like portions of each of the original solutions. A number of such experiments were made, and the results of seven of them are here tabulated, which so fairly represent the whole series that it would be an unnecessary waste of space to include a greater number.

I will invite your attention to the fact that with the exception of ammonium picrate and sulphuric acid, the substances which I experimented with represent the proximate principles contained in plants, and do not include metallic salts that may be decomposed to form basic insoluble compounds.*

TABLE No. 1.

No. of experiments.	Substance used.	Original.		After Dipping.	
		Grains precip.	Normal NaOH.	Grains precip.	Normal NaOH.
1	Hydrochlorate of Berberine	0.177		0.143	
2	Sulphuric Acid		9.0		8.4
3	Citric Acid		12.2		13.6
4	Carbazotate of Ammonium	2.777		2.370	
5	Oxalic Acid		9.4		9.2
5*a*	Oxalic Acid		6.4		5.6
6	Hydrochlorate of Quinine	1.182		1.100	
7	Bisulphate of Quinine	3.481		3.371	

NOTES.—The alkaloids were determined by precipitation with solution of carbazotate of ammonium dried and weighed. The carbazotate of ammonium was precipitated with di berberine sulphate, dried and weighed. The acids were tested volumetrically by normal soda solution.

It will be seen that in each instance the solution was dissociated, the liquid that remained after dipping the paper containing less dissolved matter than a like amount of the original solution. I have not introduced investigations with substances like gums and albumen, but I believe the well-defined chemicals are fairly drawn upon, and perhaps these figures may indicate more plainly than my paper of last year that a source of error in delicate manipulation may occasionally be due to the free use of filter paper, although it is true that it would be exceptional to use the proportion of paper employed in these experiments.

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* A continuation of my investigations with these bodies is to be found further along, and the matter herein presented is but one feature in each experiment. The reader is referred to table No. 2.

It having been shown that the simple saturation of a material generally regarded as passive may result in a marked disintegration of various solutions, I am now led to ask what effect pressure will exert upon materials that have been saturated in this manner, and which contain a larger proportion of dissolved matter than was held in the original liquid. The query arises, will a liquid that is recovered by expression from such a saturated medium be of greater or less strength than the original solution, and will it be of uniform composition, from the commencement until the end of the operation? In order to determine this point, a combination screw and knuckle-joint press capable of exerting a pressure of 2,000 pounds to the square inch was employed. The saturated paper was placed between metal plates of such a form that as the liquid issued from the paper it flowed in grooves down a short incline to a common center, and was then collected by fractions in separate vessels. Equal amounts by measure of these collected fractions were then examined. The fractions of expressed liquid from one lot of paper were all examined simultaneously, the results being as follows:

EXPERIMENT NO. 1.

Filter paper was immersed in a saturated aqueous solution of hydrochlorate of berberine; the saturated paper was removed and subjected to expression; the liquid expressed was collected in portions of two fluid drachms each. These liquids were separately precipitated by means of a slight excess of carbazotate of ammonium. The precipitates were then dried and weighed.

The original solutions gave 0.147 grain of carbazotate of berberine from two fluid drachms.

The liquid left after saturation of the paper in it, gave 0.143 grain.

The reserved fractions collected from the press gave:

1st.	2d.	3d.	4th.	5th.	6th.
0.102 gr.	0.100 gr.	0.099 gr.	0.096 gr.	0.091 gr.	0.082 gr.

7th.	8th.	9th.	10th.	11th.
0.081 gr.	0.080 gr.	0.079 gr.	0.077 gr.	0.062 gr.

EXPERIMENT NO. 2.

A dilute solution of sulphuric acid was examined volumetrically by means of normal solution of caustic soda, the required amount of the reagent necessary to saturate 2 fluid drachms of the fractions being as follows:

Two fluid drachms of the original liquid required 9 cc. of normal soda solution.

Two fluid drachms of the liquid remaining after saturation of the paper required, 8.4 cc.

The reserved fractions as collected from the press required:

1st.	2d.	3d.	4th.	5th.	6th.
8.0 cc.	7.8 cc.	7.8 cc.	7.4 cc.	6.8 cc.	6.2 cc.

EXPERIMENT NO. 3.

A solution of citric acid was examined as in Experiment No. 2.

Two fluid drachms of the original liquid required 15.2 cc. of normal soda solution.

Two fluid drachms of the liquid remaining after saturation of the paper reauired 13.6 cc.

The reserved fractions as collected from the press required :

1st.	2d.	3d.	4th.	5th.
13.6 cc.	13.6 cc.	13.6 cc.	14.4 cc.	14.4 cc.

EXPERIMENT NO. 4.

A solution of carbazotate of ammonium was experimented with in the same manner as in No. 1, and the fractions of two fluid drachms were separately precipitated with a solution of di-berberine sulphate. The precipitates were dried and weighed.

Two fluid drachms of the original solution gave 2.777 grains of carbazotate of berberine.

The liquid after saturation of the paper gave 2.390 grains.

The reserved fractions as collected from the press gave :

1st.	2d.	3d.	4th.	5th.	6th.	7th.
2.390 gr.	2.406 gr.	2.400 gr.	2.355 gr.	2.230 gr.	2.250 gr.	2.340 gr.

EXPERIMENT NO. 5.

An aqueous solution of oxalic acid was collected in fractions of two fluid drachms each in the same manner, and the proportion of acid determined by normal soda solution as in Nos. 2 and 3.

Two fluid drachms of the original solution required for saturation at 9.4 cc. of normal soda solution.

Two fluid drachms of the solution after saturation of the paper required 9.2 cc.*

The reserved fractions as collected from the press required :

1st.	2d.	3d.	4th.	5th.	6th.
6.6 cc.	6.8 cc.	3.4 cc.	2.8 cc.	2.8 cc.	2.4 cc.

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* I wish to call attention to the slight decrease between the original liquid and the acid in the solution after dipping the paper. This was owing to the large amount of solution employed. There is a greater proportion of dissolved matter taken by the paper when the excess of the liquid is slight. This is shown by an experiment wherein a small excess of solution of oxalic acid was used, the result being as follows: (See Table 1, No. 5*a*.)

2 fl. ʒ of original solution required 6.4 cc. of soda solution.

2 fl. ʒ of solution after dipping paper required 5.6 cc. of soda solution.

EXPERIMENT NO. 6.

A solution of hydrochlorate of quinine was treated in the same manner, and the fraction of two fluid drachms each, precipitated with carbazotate of ammonium. The precipitates were dried and weighed. Two fluid drachms of the original liquid gave 1.182 grains of carbazotate of quinine.* The solution, after saturation of the paper, gave 1.100 grains. The reserved fractions, as collected from the press, gave:

1st.	2d.	3d.	4th.	5th.
0.872 gr.	0.892 gr.	0.900 gr.	0.787 gr.	0.837 gr.

EXPERIMENT NO. 7.

A solution of bisulphate of quinine was next experimented with as in the other cases.

The original solution was transparent, and was kept for twenty-four hours before being used. The paper was saturated, then quickly removed and squeezed.

Immediately upon removal of the filter paper from the solutions, crystals shot throughout the excess of liquid, which quickly became a magna of crystals of ordinary sulphate of quinine. The fractions of expressed liquid formed crystals, from Nos. 1 to 4 in abundance, the proportion being greatest with the first expressed liquid and decreasing with each succeeding. From Nos. 5 to 8 they were almost absent.

Sulphuric acid was cautiously added to each fraction until the crystals dissolved, then each solution was precipitated with solution of carbazotate of ammonium, the precipitate dried and weighed.

Two fluid drachms of the original liquid gave 3.481 grains of carbazotate of quinine.

The solution, after saturation of paper, gave 3.371 grains.

The reserved fractions, as collected from the press, gave:

1st.	2d.	3d.	4th.	5th.	6th.	7th.	8th.
2.528 gr.	2.126 gr.	1.965 gr.	1.524 gr.	0.928 gr.	0.689 gr.	0.461 gr.	0.324 gr.

In studying the series, we should remember that the liquid absorbed by the paper contained a larger proportion of dissolved matter than a corresponding quantity of the original solution. Recognizing this fact, it might be inferred that unless the paper really has a decided affinity for the substance dissolved, the solution squeezed from it would be more concentrated than the original liquid. The result shows that the contrary is true, for in no instance did the expressed fractions of any series contain as much dissolved matter as a like bulk of the original liquid; and in but two cases did it equal the solution after immersion of the paper. A notable exception is No. 3, where we find the last two fractions of expressed liquid richer than any preceding, and even richer than the liquid remaining after the saturation of the paper in the original solution. In No. 4 we find the same proportion of dissolved matter in the first fraction as in the weakened solution left after saturating the paper, an increased proportion in the second and third fractions, than a decrease, and afterwards another rise in the sixth and seventh. No. 5 exhibits a slight increase in the second fraction, which is exceptional, there being otherwise a regular decline in that series. Nos. 1 and 7 show a steady, unbroken fall from the original solution to the fraction under greatest pressure, while No. 6 is remarkably irregular. There is, however, generally an unmistakable decrease as the pressure increases. (See diagram, p. 417).

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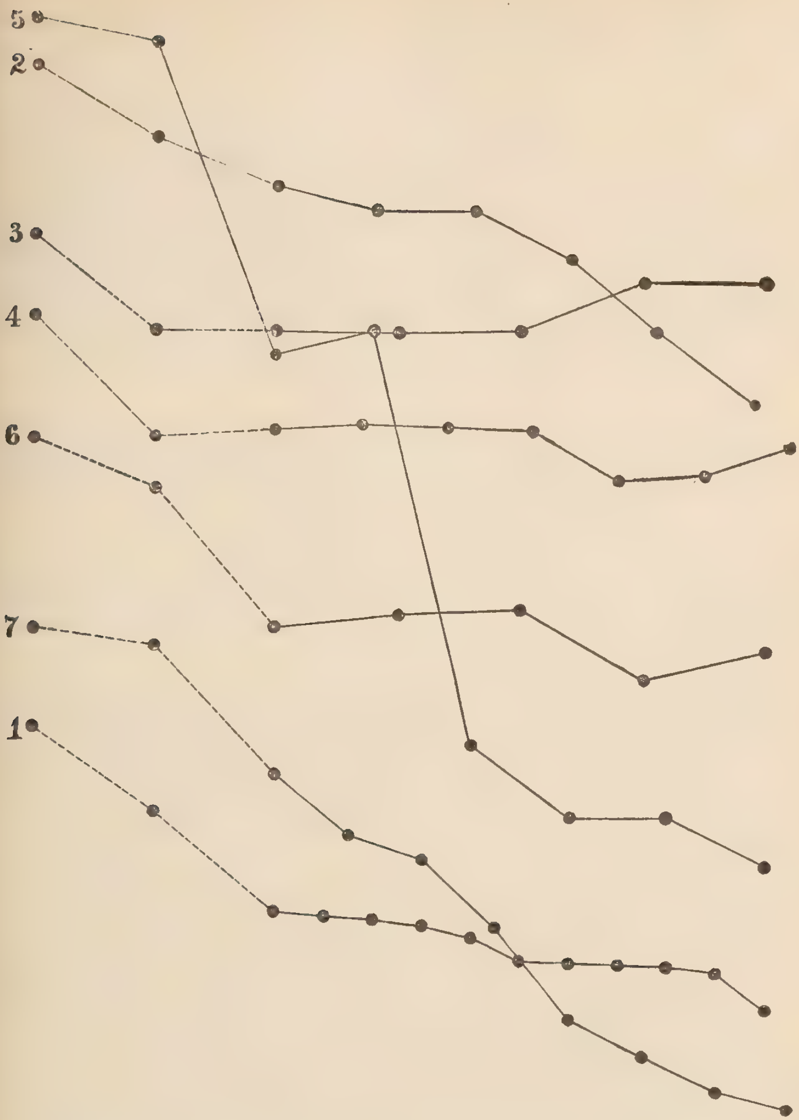
* It will be observed that I use carbazotate of ammonium to determine the alkaloids. While it is true that carbazotates of some alkaloids are far from insoluble, they are mostly scarcely soluble. In these investigations the comparison of results will be the same, even if some of each precipitate is dissolved.

Errors. In conducting investigations like these, aside from errors of manipulation, we necessarily meet with influences that may lead to wrong conclusions, and I will call attention to some that are prominent.

In collecting the fractions, it has been as yet impossible for me to collect the liquid continuously in the exact order in which it issues from the press. Occasionally a few drops will collect separately which refuses to unite with the main body until long after the fraction to which it belonged has been collected and reserved. Doubtless the flowing liquid also forms pools and eddies that become only slowly mixed with the stream, and these would cause variations such as are shown by the diagram. According to the nature of the liquids, the plates use were of metals not liable to be attacked, and in some cases heavy sheet lead was employed. The pressure in these instances forced the paper into the lead, and the flow of liquid was thereby rendered less regular. Evaporation would tend to a continued concentration of the fractions in the order of their production, but this influence was uniformly exerted in favor of the succeeding fractions, so that no decrease of material could result from that cause.

We should, in my opinion, expect variations such as we find, even though there is a general decrease from beginning to end. We should, therefore, note chiefly the general result, and it is not impossible that in experiments 1 and 7 the errors referred to were more than counterbalanced by other errors, so that the decline in strength of the series of fractions of liquid remained unbroken. A different division of the collected fractions would overcome in some instances the decided irregularity noted, and the very irregular results in Experiment No. 6, if the expressed liquid had been collected in four drachm fractions, would have been reduced to an unbroken fall.

Therefore, to arrive at the true lesson of this work, I would divide the liquids of each series into three groups and examine equal parts of each:



Explanation.—The dots on left side represent the original liquid.

The first dot to the right represents the decrease in dissolved matter after saturation of the paper.

Each dot thereafter represents the position of the corresponding fraction of expressed liquid.

The figures on the left show the number of the experiment, and correspond with our text and the tables

In order to bring all the experiments into the required space, they were not taken in natural der and are drawn on different scales.

1st the original liquid, A of table.
2d the surplus after saturation of the paper, B of table.
3d the total expressed liquid, C of table.

TABLE NO. 2.

	A	B	C
	Two fluid drachms of original liquid.	Two fluid drachms of the liquid remaining after saturation of the paper.	Average in two fluid drachms of the mixed expressed liquids.
No. 1. Hydrochlorate of Berberine.	0.177 grain precipitate.	0.143=81 per cent.	0.086=49 per cent.
No. 2. Sulphuric Acid	9.0 cc.soda sol. req'd.	8 4 =93 per cent.	7.3 =81 per cent.
No. 3. Citric Acid	15 2 " " " "	13.6 =89 per cent.	13 9 =91 per cent.
No. 4. Carbazotate of Ammonium .	2 777 grains precipitate.	2.370=85 per cent.	2.338=84 per cent.
No. 5. Oxalic Acid.	9.4 cc. soda sol. req'd.	9.2 =98 per cent.	3.9 =51 per cent.
No. 6. Hydrochlorate of quinine . .	1.182 grains precipitate.	1.100=93 per cent.	0.857=73 per cent.
No. 7. Bisulphate of Quinine. . . .	3.481 grains precipitate.	3.371=97 per cent.	1.318=38 per cent.

The average loss from the solutions, after saturation of papers, was 9 per cent.

The average loss from the solutions, obtained by pressure, was 33 per cent.

It will be seen from this table that each surplus liquid, after the saturation of the paper, contained a decreased amount of dissolved matter as compared with the original solution, and that, with one exception (No. 3), there was a marked decrease in the averages of the expressed liquid, as compared with the surplus liquid. There was a loss of 9 per cent. in the saturated solutions and of nearly one-third (33 per cent.) in the expressed liquids, from which general result I think we may accept as a rule the lesson that:

1st. The dipping of substances like filter paper into such solutions as we here considered may be attended by a separation of dissolved matters.

2d. Liquids expressed from such materials do not necessarily contain the proportion of dissolved matter that was held by the original solution.

3d. Like amounts of the expressed liquid (as shown before) may vary greatly in composition.

It is a relief to have passed the features of my paper embodied in this and the section of last year. These investigations are purely artificial, and yet I was led to them from results obtained in practical manipulation. They were made to aid me to study out certain inconsistencies in my work that could not be accounted for under generally accepted theories regarding the exhaustion of drugs by percolation, or maceration and expression. In the act of exhausting most plants we have soluble bodies to separate from wood fibre and other substances (that resemble filter paper and wood pulp), as well as some insoluble mineral principles. We also have to consider in the liquid product the attraction that may exist between inert matters precipitated from solutions, and active constituents of the liquid. It is true also that as pharmacists we often use filter paper, paper pulp, felt, phosphate of calcium, carbonate of magnesium, and perhaps other presumably passive bodies, to aid in filtration or the clarification of liquids. I hope soon to bring before you a phase of the subject more interesting to active pharmacists; but before entering upon that section of this study, I will call attention to the important distinction between the investigations here brought to your attention and the extraction of plants in pharmacy, as follows:

In these experiments, dry, passive materials have been soaked in liquids that contain in solution the soluble substances with which the materials were brought into contact, while in the exhaustion of a vegetable drug the liquid is free from contamination, and the substances to be extracted are locked up in the dry plant, and there associated with the passive insoluble materials.

This is an important distinction, and the problem under consideration demands an investigation of that feature, which, owing to the length of this paper, will be deferred until another meeting.

ON THE USE OF FLUID EXTRACTS FOR MAKING OTHER PHARMACEUTICAL PREPARATIONS.*

BY OTTO A. WALL.

QUERY No. 61.—*Is it proper to prepare tinctures, wines, syrups, decoctions, infusions, etc., from fluid extracts; and if so, to what extent?*

This question is one of great importance, because the habit of making these preparations in the manner indicated in the query is a very common one; and, if the method is not a proper one, it should be known, and the whole influence of all true friends of pharmaceutical progress be exerted against the encroachments of the usage.

If the habit is to be allowed in certain cases and not in others, it must first be determined on what grounds this shall be done. We will therefore establish as a rule that this method can be permitted only in case the product is practically identical in pharmaceutical character and in therapeutical value with the preparations made in accordance with the standard—the U. S Pharmacopœia—while it is not to be allowed when the product differs.

In order to arrive at a proper conclusion it is necessary to consider the nature of the various preparations, and compare them with each other.

No class of pharmaceutical preparations has met with so much favor as the fluid extracts. These are deservedly popular, because they fully represent all of the active properties of the respective drugs in a compact form and in an easily assimilable condition. Fluid extracts are the best class of pharmaceutical preparations, and are generally considered so, if we may judge from the demand for them.

That a fluid extract represents the full value of the drug, if properly prepared, will be conceded by every one who has had much experience in making these preparations. When alkaloids or other ascertainable and assayable substances are contained in the drug, an assay of the properly made fluid extract should yield the same percentage as the crude drug itself. The fact that some manufacturing, as well as retail, pharmacists make inferior fluid extracts does not neutralize this general truth.

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* Presented at the Fourth Session.

This much being conceded in regard to the theoretically perfect fluid extract, it is a question whether it is achieved in the actual fluid extract. The writer believes that a fluid extract made by re-percolation from fresh and good drugs, by a competent worker, does come up to the theoretical requirements.

Let us now look at the tinctures. They are much weaker preparations than fluid extracts, but resemble the latter in other regards. Some tinctures are absurdities therapeutically, as, for instance, the tincture of conium, in which much of the proper action of the drug is neutralized by the antidotal effect of the alcohol in the same preparation, and all tinctures are superfluous when fluid extracts are at hand. Physicians could only be the gainers if they would use fluid extracts instead, adding alcohol as a separate ingredient of the prescriptions in cases in which its use was indicated. In other words, no harm would be done if tinctures became obsolete and were dropped from the pharmacopœia.

If made by the retail pharmacist they are usually made in small quantities; and as he cannot well buy less than two or three times as much drug as he needs at the time, and as he does not care to make up more tincture than he needs within a reasonable time on account of the cost of the alcohol which becomes for the time being dead stock, he puts away the remainder of the drug and uses it at long intervals, perhaps until all is consumed. The last portion of drug in the meantime has often become inert, and many of such tinctures are therefore worthless.

Now a tincture made by percolating 100 grams of a drug with enough menstruum to yield, say, 500 grams of tincture, cannot by any possibility contain more than was also contained in the drug. But if 100 cubic centimeters of fluid extract also contains all that is of value in 100 grams of the corresponding drug, then a mixture of 100 cubic centimeters of fluid extract with enough of the proper menstruum to make 500 grams of tincture must be identical with 500 grams of tincture made by percolation. According to the conditions agreed on, therefore, the tinctures may be prepared from the corresponding fluid extracts, taking care, of course, to make due allowance for the difference between weights and measures of certain tinctures.

By making the tinctures from the fluid extracts we gain the advantage that we can work up all our crude drug at once into fluid extract, and by this avoid the deterioration of it.

The unconscious common sense of a multitude often hits on a right idea, even without its being formulated in exact thought by the individual;

and this aggregate common sense has led to the making of tinctures from fluid extracts, in spite of the unwarranted remonstrance of some few who see nothing but retrogression in any departure from traditional pharmaceutical usages, no matter how contrary to common sense the latter may be. The Pharmacopœia recognizes the principle in the case of tincture of ipecac and opium, and it is to be hoped will recognize the superiority of the process by adopting it for all tinctures of vegetable substances from which fluid extracts can be made.

Some have objected that the habit was encouraged in the interest of manufacturing pharmacists, to increase their sales of fluid extracts. To these it may be answered that no one is compelled to buy his fluid extracts unless he finds it to his interest to do so; and the fact that many of our most successful pharmacists buy rather than make their fluid extracts, shows at least that there are two sides to the question as to the advisability of buying or making. In reality this view has absolutely nothing to do with the question at issue, of making tinctures from fluid extracts, although the prejudice of some has attempted to make the process appear as the wicked invention of the manufacturer.

In this connection it may therefore be proper to fortify my own views with a quotation from an interesting paper by Mr. C. H. Chas. Klie, of St. Louis, on "Percolation *versus* Maceration," which was read on June 17, this year, at the meeting of the Missouri State Pharmaceutical Association. After urging the advantage of percolation over maceration, he adds:

"Having enlarged on the advantages of the new method of preparing tinctures, it may not be out of place here to consider the newest method, if such it may be called. By it tinctures are made faster than by any other. It is to make them from fluid extracts. The Pharmacopœia does not authorize making them in this manner, nevertheless a good many pharmacists follow the practice. A more convenient and practical method can hardly be devised, and all it needs is the sanction of the Pharmacopœia.

"Tinctures are more easily made by percolation than fluid extracts. If a pharmacist can make good fluid extracts, or, the next best, if he can buy them, the tinctures made from them will also be good. * * *

"From all this it is apparent that, although the German pharmacist is required to make tinctures according to the old method (maceration), the other pharmacopœias have adopted the new (percolation), thereby proclaiming its advantages over the old. They may in the course of time adopt the newest, or discard tinctures altogether, and put fluid extracts of uniform and definite strength in their place."

All who know Mr. Klie know him to be not only a capable, but an exceedingly conscientious, careful, and observing worker, and at the same time one who certainly will not be accused of partiality towards manufacturing pharmacists. In fact, he may fairly be classed as antagonistic to the interests of manufacturers, and yet his testimony is strongly and unequivocally in favor of this method of making tinctures.

Actual comparison of tinctures made by diluting fluid extracts and by percolation from the drug itself, have shown equal amounts of solid residue and equal effects therapeutically, and the writer is convinced that the arguments in favor of the process far outweigh any that can be urged against it.

We have as advantages: probable average greater activity on account of less chance of using deteriorated drug; less stock of drugs necessary; less cost of labor; less capital required to carry stock, as a small quantity of tincture only, or even none of those more seldom employed, need be on hand, any that is prescribed being readily made extemporaneously, if desired; less expenditure, therefore, for stock bottles, shop furniture, etc. If the preparations are purchased, as by many country physicians and pharmacists is altogether done, add saving in cost of packages and in freight, etc.

Against these and other advantages is to be placed only the veneration for old habits, for the writer does not know one single valid argument why tinctures should not be prepared by diluting fluid extracts, unless it is that the fluid extracts as prepared by some, are not what they should be, and therefore tinctures made from them will not be full strength. Admitting this, it simply argues that greater care should be used in securing good fluid extracts, for it is just as improper to use inferior fluid extracts as to use inferior tinctures. Besides, the use of inferior fluid extracts is more than counterbalanced by the use of the shop-worn and inert drugs so often nsed in making tinctures.

In answer to the first part of the query, therefore, we must admit the propriety of diluting fluid extracts to make tinctures. As to the extent to which this may be done, the writer believes that it should be the principal process of the Pharmacopœia, leaving percolation as an alternate process, as being more applicable and economical when making large quantities, as by manufacturing pharmacists who usually posses better facilities for obtaining fresh good drugs at any and all times.

Medicated wines are similar to tinctures, the menstruum also being an alcoholic one, although of less strength. They are little used at the present time, and are as much inferior to tinctures as these are to fluid extracts. Only eleven are recognized by the Pharmacopœia, and one of these, wine of ipecac, is directed to be made from the fluid extract. At least four of the others should be made in the same way, and as they are used so seldom, they might be extemporaneously prepared when wanted.

In regard to tinctures and wines, there can be no question that the products are practically identical, no matter whether we use the process of maceration, percolation, or diluting fluid extracts, and as, therefore, the process cannot possibly affect or influence the pharmaceutical character or the therapeutical value of the preparation, it should be optional which process is to be used, the preference being given to the last.

Some elixirs may be prepared from fluid extracts, but as these are not official preparations, any one can make them as he pleases, and they, therefore, scarcely come within the province of the query.

The answer to our query is not so simple, however, when we consider syrups, infusions, and decoctions. These are essentially aqueous extracts, the syrup being prepared by adding enough sugar to exert an anti-fermentative action. When a syrup is made in other ways than from fluid extract, it seldom contains alcohol, and is, therefore, not identical with one made from the fluid extract. The argument made in the case of the tinctures and wines, of absolute identity of therapeutical value, cannot be urged as strongly for syrups, and the right or wrong of departing from the pharmacopœial processes is not so clear.

We have in the Pharmacopœia twenty syrups made from vegetable drugs. Of these, thirteen might possibly be made from fluid extracts, and more than half of these, or seven, are so ordered to be made. The principle being recognized to this extent, it is probably no great transgression to make a few others in the same way. The advantages are that no great quantities of syrup need be made at a time, as this frequently causes loss of materials through spoiling; while if the quantities made are small, there is a disproportionately great expenditure of time and labor.

We come now to consider infusions and decoctions. These are practically alike, differing merely in the time of maceration in water and the temperature of the water employed. The infusion or decoction made in the proper way is pharmaceutically and often therapeutically entirely unlike a mixture of a fluid extract in water. There can be little doubt that as a class these are primitive, unsatisfactory and unreliable preparations, and that in almost all cases the mixture of fluid extract with water is therapeutically superior.

Physicians would find it much more satisfactory to write prescriptions for dilutions of fluid extracts with water, and should discard the use of the unscientific decoctions and infusions altogether. But we doubt whether the pharmacist is authorized in dispensing a diluted fluid extract when an infusion or decoction is prescribed. The excuse that he is dispensing even better than is prescribed is not acceptable, because the pharmacist has as little right to dispense a more active as a weaker medicine.

Besides, there is not only a difference in *degree*, but also sometimes in *kind* of action. Careful observers agree that the action of an alcoholic preparation of digitalis is different from that of an aqueous preparation from the same amount of drug. So also there is a difference between the merely astringent effect of infusion of buchu and the somewhat stimulant alterative blenorrhetic and astringent effects of the fluid extract of buchu.

Therefore a change from the use of infusions or decoctions to a use of diluted fluid extracts must come from the medical profession if it comes at all, and pharmacists are not warranted in substituting the latter for the former. Whether in cases of emergency the practice may be defended with the plea of necessity, I leave for others to argue; such a plea is apt to be abused, and in the writer's opinion should rarely be allowed to influence our dispensing.

To resume: tinctures and wines may be legitimately made from fluid extracts; likewise most syrups, when they can be made in that way; while the solutions of fluid extracts in water, which generally are superior, are yet frequently so different from infusions and decoctions in strength, and occasionally in mode of action, that they cannot indiscriminately be used one for the other without the expressed consent of the prescribing physician.

OUR ABSTRACTS.*

BY V. COBLENTZ, SPRINGFIELD, O.

The class of pharmaceutical preparations known as abstracts, now having been in the market before us for some little time, the query naturally arises whether these preparations fulfill their object or not, and to what extent? These, as you remember, were intended to replace the commercial powdered extracts, which were placed upon the market by our manufacturers, their method of manufacture being kept secret; now the great variation existing in the yield of solid extracts would necessarily result in a lack of uniformity in their medicinal strength. The advantages possessed by the abstract are in the convenience of adjustment of its dose, convenience in dispensing, ease of preservation in its powdered condition, also that it is intended to bear an accurate and known relation to the drug, which *must be of undoubted quality.* Again, an abstract should represent the entire amount of the activity of the *best* selected drug which it represents; yet as they are in no case directed to be made from standardized drugs, then the variation of the medicinally active principles contained in the abstracts, must be in proportion to that naturally existing in the crude drugs. Hence in face of these questions we are led to inquire into the subject.

Samples consisting of original packages of seven different manufacturers of these products were obtained, numbered and examined, as given below. The amounts examined were weighed immediately from their containers, on a balance sensible to the milligram.

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* Presented at the Fourth Session.

ABSTRACTUM ACONITI.

In the assay of pharmaceutical preparations of aconite the question, as to whether the amount of aconitine obtained determines the *full* medicinal activity of the drug, is disputable. Were the preparations of aconite employed for the effect of the aconitine alone, then a preparation of the alkaloid would be all that is necessary; but the difference between the effect of the alkaloid aconitine and a pharmaceutical preparation of the root, leads to the assumption of the value of other principles which might be present. It has been noticed that plants, which contain active crystallizable principles, contain besides these amorphous principles resembling them to a certain extent. According to Laborde this tuber contains two amorphous principles, differing in a degree from aconitine, and undoubtedly modifying the properties of the latter. For the separation of *all* the therapeutic principles, ether fulfills the purpose; although the remaining liquors are still affected by alkaloidal reagents, yet they have not produced any physiological effect in the hands of experienced experimenters. The active principles were thus separated, weighed and compared as total aconitine, thus affording us an accurate comparative idea of the value of the abstracts. 5 grams of the sample was weighed, placed in a suitable flask with an excess of absolute alcohol, (acidulated with tartaric acid if necessary), and allowed to digest several hours at a low temperature, was then carefully filtered into a beaker; when all the liquid had passed through, the filter and its contents were returned to the flask and again treated as before; this was continued until when a few drops of the filtrate evaporated on a watch glass and tested for presence of alkaloids gave no reaction. A small quantity of distilled water was then added to the mixed alcoholic filtrates, the alcohol then driven off by heat; the aqueous solution, containing the alkaloid as acid tartrate with extractive matter of the abstract, was then shaken several times with an excess of absolute ether in a separating flask, depriving it of its soluble coloring matter, an organic amorphous acid and the free tartaric acid, while the tartrate of the alkaloid remains. Potash bicarb. is now added in slight excess, setting the alkaloids free; when the carbonic acid gas had ceased to be evolved, the liquid was again shaken 4 or 5 times with excess of abs. ether. The mixed ethereal solutions were allowed to evaporate spontaneously in a tared beaker and then dried at a low temperature and weighed. The appearance of the samples varied but little, being generally that of a shade of red-brown; the alcoholic solution was acid to litmus in three, and neutral in balance of samples. A sample of abstract was carefully prepared from Squibb's pulv. aconite root and subjected to above treatment, and placed for comparison in the table.

Quantity: 5 grams abstract equivalent to 10 gms. drug.

Sample.	Amount.	Alkaloid.	Per cent. Alkaloid.	Per cent. Alkaloid in drug.	Color.
No. 1	5 gms.	.012 gms.	0.24 %	0.12 %	Yellow brown.
No. 2	“	.021 gms.	0.42 “	0.21 “	Dark red brown.
No. 3	“	.017 gms.	0.34 “	0.17 “	Light red brown.
No. 4	“	.010 gms.	0.20 “	0.10 “	Red brown.
No. 5	“	.006 gms.	0.012 “	0.06 “	“ “
No. 6	“	.009 gms.	0.018 “	0.09 “	“ “
No. 7	“	.019 gms.	0.38 “	0.19 “	Light brown.
Sample prepared.	“	.020 gms.	0.40 “	0.20 “	“ “

Samples Nos. 5 and 6 are sufficiently below standard to be rejected.

ABSTRACTUM JALAPÆ.

This by far, is the best officinal preparation of jalap that we have had, being about 10 % stronger and having wisely supplanted the old officinal extract, which at best was a feeble representative of the drug, without any uniformity, and being impossible to preserve in a powdered form. The amount of alcoholic extract and resin yielded by the tubers, even when selected with the greatest care from the market, is very variable in its amount, particularly too much so for any very accurate limitation to it. Yet as the *amount* of resin and alcoholic extract yielded, closely indicates their variation, it thus gives us a means of comparison of the quality of the pharmaceutical preparations of the same.

In view of this, unless the manufacturer takes the pains to determine the actual quality of his jalap before working it up, he may turn out an abstract or any other preparation of the same very deficient in strength, yet having at the same time employed the full amount of his drug. In judging the quality of these preparations, we have one limit established for us by the U. S. P., which specifies that it should not contain *less* than 12% of resin. On the authority of Dr. Squibb the percentage of *alcoholic extract*, as obtained by him from 34 operations embracing 7.973 pounds, varied from 10.7 to 26%, making an average of about 18%, which figure we will accept as the standard for alcoholic extract.

5 grams of each sample was weighed into a flask and allowed to macerate for some time, shaking each flask twice daily, after which the contents of each one was carefully poured upon a wetted filter and filtered into a beaker; the entire contents were gradually rinsed on to the filter, and when drained off, the filter and contents were returned to the flask and warmed with another portion of alcohol, and filtered as before.

As soon as the filtrate ceased to leave any perceptible residue, when a few drops were evaporated upon a watch glass, the mixed filtrates were made up to a definite volume and divided into two equal portions, the first was evaporated in a tared beaker on water-bath until it ceased to lose weight, and then weighed. The second portion was concentrated to a syrupy consistence, and precipitated in an excess of water, allowed to stand for some time, and when fully settled, was decanted and further washed by decantation, dried and weighed. The color of the samples examined will be seen to vary considerably, from a nearly white to a dark rust brown, being caused by the differing of the menstruum employed: the more hydro-alcoholic the menstruum, the more coloring matter removed. The lightest-colored sample consisted of almost pure resin combined with the sacch. lactis.

Accordingly, as the abstract represents 1 part of itself equivalent to 2 parts of the drug, then it (abstract) should contain, according to the U. S. P., not less than 24 % resin, and according to Dr. Squibb's averages, 36 % of alcoholic extract.

Quantity of abstract = 5 grams = to 10 grams of drug.

Sample.	Alcoholic Extract.	Resin.	Per cent. of Alcoholic Extract.	Per cent. Resin.	Color.
No. 1.	2.058 gms.	1.317 gms	40.1 %	26.3 %	Rust brown.
No. 2.	1.125 gms.	1.060 gms.	22.4 %	21.2 %	Gray.
No. 3.	0.878 gms.	0.871 gms.	17.5 %	17.4 %	Dark gray.
No. 4.	1.418 gms.	1.270 gms.	28.3 %	25.4 %	Light brown.
No. 5.	1.353 gms.	1.218 gms.	27.0 %	24.3 %	Light brown.
No. 6.	1.563 gms.	0.863 gms.	31.2 %	17.2 %	Dirty white.
No. 7.	0.974 gms.	0.521 gms.	19.5 %	10.4 %	Yellow brown.
Standard limits. . . .	1.800 gms.	1.200 gms.	36.0 %	24.0 %	

It will be seen that though the alcoholic extracts found are at variance, the per cent. of resin in four is fully up to the requirements of the U. S. P., while the remaining three fall considerably below.

ABSTRACTUM NUCIS VOMICÆ.

The subject of the thorough exhaustion, with the selection of the proper menstruum that would, when the operations were properly conducted, yield a tincture that would always be uniform in strength, has brought forth considerable controversy. That a great difference existed in the alkaloidal strength of the commercial tinctures, has not only been shown by our own but also by foreign writers; this difference being caused not only by a variation of the amount of alkaloidal matter in the seed, but also by differences in the alcoholic strength of the various menstruums employed, with the care bestowed in the exhaustion. It is true that the manufacture of pharmaceutical preparations of nux vomica has been very trying to our manufacturers, not only from the difficulties attending exhaustion, but from the variance of alkaloidal matter present in the commercial seeds; yet since the late and thorough investigations of

Messrs. Dunstan and Short with those of our own writers upon this subject and the care which our late Pharmacopœia has bestowed upon this subject, has rendered it so plain that deficient pharmaceutical preparations of it should not be tolerated. In order to obtain the nux vomica in proper condition for assay, 5 grams were weighed into a flask with an excess of a mixture of 8 parts of alcohol (U. S. P.) with 1 part water and digested on water-bath for 24 hours, then carefully poured on to a filter and filtered into a tared beaker; when the filter had drained off, the filter and contents were returned to the flask and treated as before; this was continued until the filtrate ceased to possess the persistent bitterness and gave no reaction with alkaloidal reagents. The mixed alcoholic solutions were evaporated to dryness on water-bath, and when it had ceased to lose weight was weighed. The amount of total alkaloids was then estimated in this extract by the process recommended by Messrs. Dunstan and Short, as found by them to yield the most accurate results. It is thus: "About one gram of the extract is dissolved in a strong solution of sodium carbonate with the aid of a gentle heat. This solution is extracted with two consecutive 15 cc. of chloroform. The mixed chloroformic solutions are extracted with two consecutive 15 cc. of dilute sulphuric acid (5 per cent), and from the mixed acid solutions, which should be filtered if necessary, the total alkaloid is extracted after the addition of ammonium hydrate by agitation with chloroform, two separate quantities of 15 cc. being generally sufficient. The clear chloroformic solutions are evaporated to dryness upon the water bath, and the residue of total alkaloid weighed after exposure for one hour."

Amount of Abstract = 5 grams, equiv. to 10 gms. powd. nux vomica.

Sample.	Amount Extract.	Total Alkaloids.	Per cent. Alkaloids.	Per cent. in Seed (equiv).	Color.
No. 1. . .	0.548 gms.	0.094 gms.	1.88 %	0.94	White (nearly).
No. 2. . .	1.186 "	0.156 "	3.12 "	1.56	Gray.
No. 3. . .	1.031 "	0.112 "	2.24 "	1.12	Light gray.
No. 4. . .	1.063 "	0.231 "	4.62 "	2.31	" "
No. 5. . .	1.943 "	0.298 "	5.96 "	2.98	Brown.
No. 6. . .	1.390 "	0.176 "	3.52 "	1.76	Light Brown.
No. 7. . .	0.763 "	0.099 "	1.52 "	0.99	Dark Brown.

These chemists mentioned above, found the proportion of the total alkaloids to vary from 2.74 % in Madras to 3.90 % in Bombay seeds.

The *total* alkaloids were only given, as medical authorities attribute medicinal properties to both strychnia and brucia, hence from a therapeutical standpoint the comparison as total alkaloids was deemed sufficient.

The amount of yield of alkaloids falls in all cases except *one* below that given as found present in the poorer Madras seed, hence the quality of our abstracts of Nux Vomica are by no means up to the requirements.

Thus far we have considered the value and fulfilments of these preparations, but cannot yet consider them as a body until we have completed the examination of the remainder of them, which we hope to do and report upon at our next annual meeting.

INFECTED SOLUTIONS.*

BY R. G. ECCLES, M. D.

Aromatic waters, dilute solutions of phosphoric, citric, tartaric, oxalic, and other acids and their salts, as well as most alkaloidal solutions, encourage the growth of a variety of aquatic, cryptogamous plants, whose polluting presence renders them unfit for use. They are unwelcome visitors everywhere, but in the last-mentioned places they are a great commercial misfortune, so that their suppression is a subject of *growing interest.* That it will continue so to grow is apparent from the trend of medical science. Every advance made by therapeutics discredits the use of tinctures, infusions, decoctions, extracts, etc., as at present indiscriminately prescribed.

1st. Because all medication is found to be an injury to the system, and on no account to be indulged in except to suppress a greater evil.

2d. Because these preparations almost invariably contain some drug not needed by the patient.

3d. Because they often contain drugs positively contra-indicated by the disease, combined with such as are pressingly necessary for the same.

4th. Because the strength of such preparations is never twice alike, and it is merely an accidental guess when the proper dose is given.

5th. Because the physiological effects of many drugs are found to border upon the toxic. If too much is given, the patient is injured; if too little, he is insufficiently or not at all benefited.

This is why the alkaloids of cinchona have, to so great an extent, displaced the older forms of administration. This is why those of belladonna, nux vomica and opium, are pressing forward in the same direction. This is partially why cocaine has been found so useful at a time when coca was about to be thrown aside as of little value. The day of active principles in pharmacy is only beginning. Every year must add to their popularity, and discredit to a great extent all that now take their places. Definite solutions like those of Magendie will ere long be in daily call, and these will represent all the virtues of the vegetable world. There will then be no stimulating with alcohol when a depressant is desirable, nor constipating with tannin when heart pressure only is needed. Hypodermic medication points the way we are bound to travel, and in this method of practice all the old drug preparations are worse than useless. All the changes here foreshadowed will not come in our day. Enough, however, will, to make the loss from infection become an item of financial importance. Cocaine at ten cents per grain and eserine at twenty-five are worth saving. If we·could calculate the loss upon the former from this cause during the past year, it would no doubt amount to a snug sum.

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* Read at the third session.

EFFECT UPON HEALTH.

The commercial loss is of far less interest than the hygienic considerations involved. Can it be conducive to health to swallow these vegetables or their spores? The functionally impaired stomach and intestines of a sick person must constitute a favorable habitat for their development. They grow luxuriantly under just such conditions. Their tenacity of life is marvelous, and their kindred organisms, the bacteria, are known to cause fearful maladies. Sternberg has given a drawing* of a plant found in the fauces of patients suffering from anginal scarlatina that is suspiciously like those that grow in polluted drug solutions. This same family of plants *(Saprolegnia)* is known to attack and kill gold fish.† Cholera infantum, that carries off its thousands every summer, is said to be produced by analogous growths in a large number of cases. Thrush or sprue has a similar origin.‡ The microscope in this disease enables the physician to see pieces of the growth in scrapings from the patient's tongue. Cases of acute dyspepsia and diarrhœa, whose etiology has otherwise been unaccountable, have strangely coincided in time with soda water and old acid phosphates before imbibed. Proprietary syrups of the hypophosphites have produced emesis in patients, accustomed to the same, when dosed from an infected bottle. Mistura cretæ has been known to intensify vomiting and diarrhœa in children, and on examination the infected cinnamon water was found to be the cause. Mysterious and puzzling cases of this kind are usually attributed to an idiosyncracy, the medicine discontinued, and nothing more thought of the matter. The sarcinula ventriculi‖, a plant closely related to these, makes its home in the human stomach, causing one of the worst forms of chronic dyspepsia. The torula diabetica§ is another that makes its home in the bladder. The mucors have been found in the stomachs of dogs in full fruition, in spite of the presence of gastric juice. Birds and beasts have been infested by them in almost every tissue.* The fact is that these lowly organisms, that occupy the point of union between fungi and algæ, can be found everywhere. Their spores are often very much like bacteria, to which they are closely related. A specimen of orange-flower water lately examined contained living spores like spirilla, that when dead and dying were morphologically indistinguishable from Koch's comma bacilli. They are probably innoxious, but deliver me from drinking or prescribing such an article. Bacteria termo are usually harmless, but injected with atropia they produce septicæmia. Administered with drugs, the most harmless may become injurious or dangerous. Experience has shown that the growths that appear in alkaloidal solutions irritate and erode mucous membranes.† Since the intestinal tract is lined with this membrane, it is highly probable that they will torture it. Abscesses are developed when injected hypodermically, and very frequently nausea is associated therewith. Dr. Hager credits this to the growths causing a change in the chemical composition of the dissolved alkaloid. He experimented with an old specimen of Magendie's solution.‡ Since putrefactive bacteria are sometimes the only growths that appear in this solution, he is probably right. They are ferments. The spores of the regularly appearing plants have an odd habit of refusing to germinate until they find a rough edge or speck of dirt to use as a nidus. Once deposited on this, they send forth their sprouts immediately. The cause of their irritation may be due to this trait. Attempting to send their shoots into the tissues, they are repelled by the cells. Without being the cause of any disease, their irritating presence may often prove the last straw with sick and suffering. Is it not advisable to seek some method of at once putting an end to their dissemination?

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* "Bacteria." Sternberg's Magnin, p. 293.

† "Fungi." Inter. Ser., p. 221.

‡ "Diseases of Children." Vogel, p. 99.

‖ *Vide* name in "Chamber's Encyclopœdia."

§ "The Microscope," Hogg, p. 295.

WILL THE FILTER PURIFY?

Many foolishly imagine that the ordinary paper filter will purify these solutions and make them fit for use. This is a serious delusion. The inert filaments can be filtered out. The spores go through the meshes. A Pasteur's filter of unglazed porcelain will remove them, but no other kind can. After filtering in the ordinary manner, a good high-power microscope will find them in the solution in multitudes, and the rapidity with which a second crop appears attests the same fact.

ARE THEY FUNGI OR ALGÆ?

The place in nature occupied by these organisms is still an enigma, owing to our defective methods of classification and incompleteness of data. Cooke and Berkeley, the great mycologists, claim them as fungi.

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* "Fungi." Inter. Ser., p. 221.

† "Lancet." January 29, 1885, p. 224.

‡ "Pharm. Centralh." February 26, 1885, p. 93.

Nees, Kützing, and Pringsheim, equally high authorities as phycologists, take them into their department of algæ. Their aqueous habitat, subaqueous fructification and in asci method of conjugating, regularity of articulation, zoospores, and in fact entire make-up, affiliates them most closely with the algæ.* As such, their structure would place them in the sub-order confervacea.† Here, however, we are in trouble, since they contain no chlorophyll. The family to which their forms affiliate them (Siphoneæ) has several species in a similar condition, but they contain starch, which no known fungus does. In the drawing of sulphocyanate of potassium growth, procured by the kindness of Prof. E. H. Bartley from the laboratory shelf of Long Island College Hospital, we have an undoubted alga belonging to the confervoids. The sporidia are of this green color naturally, showing the presence of an abundance of chlorophyll. When these plants are young not a trace of it can be found, and even in old age the filaments are as devoid of color as the mycelium or spawn of any fungi. Would it then be sensible to class the young plant and part of the old one as a fungus while calling the ripened fruit only algæ? The same is true of the rest of these plants. Pringsheim has shown that the spores in ripe sporidia contain starch.‡ Are they fungi in early life and algæ in old age? Such a conclusion would be ridiculous. Some of them are capable of cultivation on damp ground, and closely resemble moulds under such conditions. There are now in my office and store crops growing upon bread where transplants have been made from strychnine sulphate and muriate, cocaine muriate, apomorphine muriate, quinine sulphate, orange-flower water, eserine sulphate, pilocarpine muriate, morphine sulphate, and citric acid. Nothing grows where a transplantation is made from dilute phosphoric acid. Three trials have failed. These growths may not be the transplanted filaments at all. In fact there is already proof that some are not, since two distinct kinds have appeared where only one was put. Care was taken to reduce the chances of air infection to a minimum, but some exposure was unavoidable. Everything used, except the plant, was sterilized, and the covering and transferring done as rapidly as possible. They have not yet been subjected to careful microscopic examination. This part of the work will necessarily be slow and tedious, and the effort to trace the aerial threads into the buried mycelium will require a great deal of time, owing to their minuteness. If such tracing can be accurately done, it will settle some disputed points. The universal tendency among those not posted in this branch of study, is the easy one of calling them fungi. Even

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* Lindley's "Vegetable Kingdom," p. 18. Le Maout and De Caisne "Botany," p. 975.

† "United States Dispensatory," p. 215.

‡ "Micrographical Dictionary." Griffith & Henfrey, *vide* "Achlya."

Prof. Bartholow, of Philadelphia, declares that they are penicillium,* and emphasizes the statement by putting this word in italics. If we consider them as fungi at all, we must class them with Prof. Cooke as allied to the mucors.† Their place would be among the sporidifera, owing to the sporidia being enclosed in asci or pockets. Having no hymenium, we would put them in the family physomycetes. Kützing names the genus, to which they belong, Saprolegnia, from a Greek word signifying rotten, because they grow so freely in the presence of decomposing matter. Nees calls it Achlya,‡ from Achlys, the goddess of obscurity. The distinction between algæ and fungi has been so long a standing quarrel, that many botanists have thrown both names away and adopted entirely new ones. Cohn || and Sachs § have each prepared a new arrangement of this whole field. The last gentleman includes the whole debatable domain under the title thallophytes.

ARE THEY FERMENTS?

To us, the question of what they do is of greater importance than what they are. Those hitherto classed as fungi have the strange power of altering the chemical composition of solutions in contact with them. Griffith and Henfrey, under the word "*fermentation*" in their "Micrographical Dictionary," say: "A general law indeed appears to prevail throughout the fungi, that their nutrition differs from that of all other plants in depending *exclusively* on the absorption and decomposition (with the evolution of carbonic acid) of organic compounds, therefore consisting of the performance of the operation of *fermentation* on the organic matters upon which they feed." Another writer says: "They must feed upon that which is already organized, either animal or vegatable, living or dead." ¶ Algæ do not act as ferments. They take carbonic acid and ammonia, or nitric acid, and build them up into tissue. If the presence of these plants has no other effect upon the dissolved drugs than merely absorbing traces for tissue requirements, any plan by which their destruction is insured practically restores the liquid to its original quality. If, on the contrary, they destroy the chemical character of the drugs they infest, no restoration is possible. Their structure is decidedly algal, whatever their mode of nutrition. Either they live as do algæ generally, or they use up already organized material like fungi and animals. Which is it? Those claiming them as belonging to the first-named order reject the notion that they are ferments, while all others naturally en-

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* "Hypodermic Method," p. 23.

† "Fungi." Cooke and Berkeley, p. 168.

‡ "Micrographical Dictionary," *vide* "Achlya."

|| "Bacteria." Sternberg, p. 65.

§ Sachs' "Botany," Appendix, p. 847.

¶ Pop. Sci. Mon., vol. ix., p. 398.

deavor to sustain themselves by putting forward such evidence as they can gather of their parasitic or fermentative nature. Aqua cinnamomi and aqua anisi usually grow putrefactive bacteria. These of course are ferments, and probably decompose the essential oils to some extent.

IS DILUTE PHOSPHORIC ACID DECOMPOSED?

Dilute phosphoric acid, in spite of the utter inconceivability of any such change occurring among its molecules, has been singled out by an advocate of the fungi theory as an example of their power.* Old specimens which he examined failed to come up to the standard in acidity or specific gravity: perhaps they never did. Other such specimens have been examined and found above the standard in both particulars: they, too, were probably made as found. Four specimens examined on July 7th, and again on August 15th of the present year, are here tabulated. Two cubic centimetres were titrated with a dilute solution of caustic potash, and phenolphthalein used as an indicator. The same potash solution was used every time. The neutral phosphate was formed.

Specimen.	Specific Gravity.		Potash Solution.	
	July 7.	August 15.	July 7.	August 15.
A	1.0562	1.0560	23 cc.	23 cc.
B	1.0582	1.0582	23.7 cc.	23.7 cc.
C	1.0582	1.0582	23.7 cc.	23.7 cc.
D	1.0592	1.0592	24 cc.	24 cc.

Only one specimen varied in spite of a full growth, and that variation is so small that it is within the limit of possible error. A difference in atmospheric humidity at the times the weighings were done might easily account for it. One thing to be regretted in this, is the shortness of the time between the weighings. Still, a ferment should work great havoc in a solution in five weeks, with young vigorous plants and hot weather. These specimens and others have been preserved for future examination. Four of citric acid, prepared on July 8 and examined August 12, gave similar results, except that a slight alteration in the weight of one occurred in an opposite direction to that in the preceding table. Any change that does occur will be cumulative, so that in a year positive results should be obtainable. But what is there in phosphoric acid to ferment? Its formula (H_3PO_4) shows nothing capable of alteration in this manner. The phosphorus alone could not be extracted without releasing free oxygen. After growing two months within a U-shaped glass tube, one arm of which was hermetically sealed and full, not a trace of gas of any kind appeared. This change therefore does not occur. Do they abstract the oxygen? If one atom is removed, phosphorous acid (H_3PO_3) must be left. Heated with mercuric chloride, no calomel was precipitated. There is then no phosphorous acid in old solutions. If re-oxidized as soon as made, it would remain unchanged in strength. But even this supposition is ruled out, for the U-tubes collected no phosphuretted hydrogen gas, which they would have done in such a case. If we next suppose that two oxygen atoms were abstracted, hypophosphorous acid (H_3PO_2) will be left. Since old specimens neither rapidly discharge the color of permanganate of potash nor precipitate sulphate of copper, this is as untenable a position as the rest. Any greater discharge of oxygen would set loose free hydrogen. No such thing occurs. One more guess remains. Two atoms of hydrogen may be stolen and metaphosphoric acid (HPO_3) result. Since we have no precipitation of albumen on adding solutions thereof, the whole theory of fermentation at this point breaks down completely.

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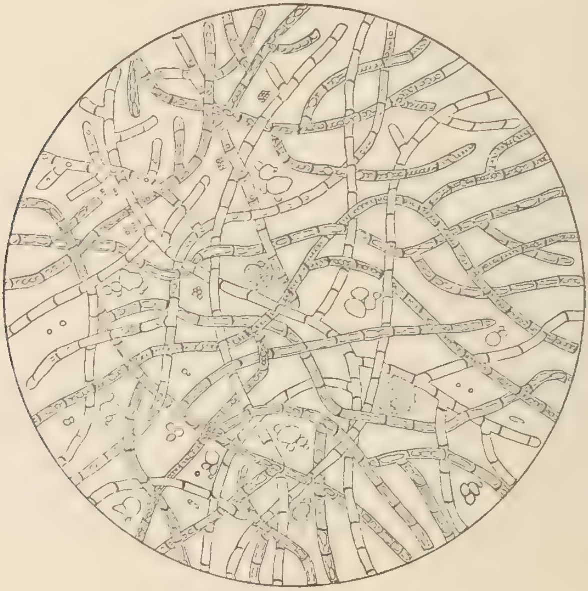
* "Proceedings A. P. A.," 1884, p. 432.

In aromatic waters and solutions of alkaloids the same is the case. Ten different kinds have been caused to grow in the U-tubes already referred to, and in no instance has the least trace of a gas appeared. These tubes are yet charged and waiting for any such change. During the progress of the experiments one feature in the growth of these plants has been very apparent. The more the solutions are exposed to the fresh air, the more rapidly they increase in size, and this independent of new centres of growth. Air filtered of all spores through sterilized cotton, and without draft, acts as well as any other. Twenty specimens sealed up in glass tubes, like those used by Sternberg in cultivating bacteria, ceased to grow. One of these into which was drawn a drop of carbonic-acid-water, developed to an appreciable extent before stopping. Closed bottles of soda water and ginger ale develop them. That they do not die very soon by hermetically sealing them, is seen by such as have been closed in microscopic slides. Sixteen of these were mounted two months ago. Five have been broken, but the remaining eleven still show signs of life. What they grow upon seems to come from the air. In limited supplies they can only live. In full supplies they live and grow, and the amount of their growth—other things being equal—depends upon the amount of free air that reaches them. The very fact that they are found in such diverse kinds of solutions indicates their almost total independence of the dissolved material. What can sulphate of magnesia contain for them to live upon? How do they gain a livelihood from boric acid?

WHAT THEY LIVE UPON.

The only assumption capable of clearing up all the facts is that they decompose carbonic acid and ammonia, or its salts found in the solution. The freed nascent oxygen escaping from the utilized carbon may help them to secure nitrogen by producing water from the hydrogen of the ammonia. The carbonic acid and ammonia are, on this supposition, absorbed from the air. In acid solutions the ammonia would necessarily exist as a salt. Those solutions in which they grow most freely will be such as are capable of taking up from the air the largest amount of their pabulum, or such as contain the largest proportion of decomposing organic matter giving out these gases. That curious pseudo-law of solubilities, supposed to apply only to solids, may have something to do with this. Bodies chemically akin tend to dissolve each other more freely than others that are not related.* A harmony in the atomic periodic time may exist in such cases to account for it. The alkaloids, with their carbon, may have some such relation to carbonic acid and with their nitrogen to ammonia. The acids can act upon ammonia by affinity, and on carbonic acid by this preference of absorption. If this is true, we should expect such organic acids as citric to provide more food for them than phosphoric. The fact is that they grow much more freely in the former than the latter. Facts and theory, therefore, coincide. The odd habit of all saprolegnia of refusing to grow without a point or speck of dirt for a nidus, would seem to meet its explanation here. Every such nidus is a point for the release of gases from their solutions. Here the young spore secures food to enable it to grow, and that without effort. This, too, is markedly the case if that nidus is a piece of rotten organic

FIG. 66.



From Muriate of Morphine.

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*"Chemical Philosophy." Tilden, p 10.

matter, for it is then giving out the very gases on which they live. All the higher vegetables act in the same manner. They are as prone to adhere to rotten matter by their roots as the worst of the saprolegnia, and for the same reason. Instead of this being a proof of parasitism, it proves the contrary. Another point worth noting is their tendency to grow toward the light. Does it assist them in decomposing carbonic acid, even in the absence of chlorophyll? Those who believe that they live upon the chemicals or drugs in whose solutions they grow, have never been able to tell where their carbon and nitrogen came from when grown in phosphoric acid. This is a point of importance.

THEIR CHEMICAL COMPOSITION.

Their filamentous sheaths are composed of cellulose in every instance. This is proven by their having taken a purplish-blue color when soaked for a few minutes in Schulze's* solution, and afterwards brought in contact with strong sulphuric acid. A microscopic examination of the zoospores is all the evidence needed that they are protoplasm. The absorption by all their cells of anilin, and hematoxylin, as well as their taking a yellowish-brown color with iodine, proves the protoplasmic nature of all within the sheath. The whole mass is soluble in strong sulphuric acid, which is blackened by their charred carbon. Nitric acid turns them into pyroxylin and dissolves them. Hot, strong, muriatic acid likewise causes their disappearance. No matter what they grow in, their reactions are alike to the reagents named. In dissolving the mthe cells are the last to disappear. Everything in their chemical make-up negatives the supposition that they live and grow upon any such substance as phosphoric acid. Nothing casts doubt upon the much more plausible supposition that they have the same kind of food no matter what they may be immersed in. As an additional test of what they live upon, five vials were filled with citric acid solution and plants put therein. A sixth contained pure distilled water. Each one was weighed separately on August 8, and again on August 21, and the amounts noted upon the bottles. During the two weeks they were opened three times to admit fresh air. All were subject to the same conditions. The results tabulated below show the amount of loss by evaporation for every bottle; the gain in weight is from absorption of gases by the plants.

	Pure Water.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
	Gram.	Gram.	Gram.	Gram.	Gram.	Gram.
August 8 . .	6.4222	6.9883	6.9675	6.9527	6.9398	6.1810
August 21. .	6.3328	6.9138	6.9302	6.8820	6.8857	6.1542
Difference. .	.0894	S. .0745	S. .0373	S. .0707	S. .0541	S. .0368
Evaporation .	.0894	M. .0894	M. .0894	M. .0894	M. .0894	M. .0894
Gain	.0000	.0149	.0521	.0087	.0353	.0526

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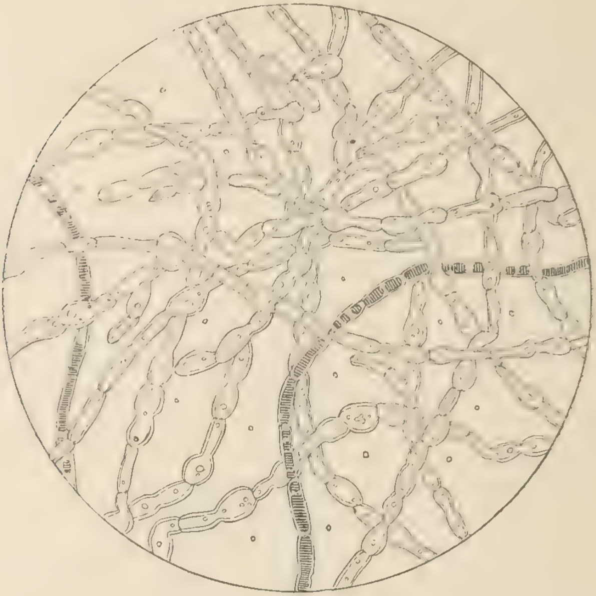
* "Plant Analysis." Dragendorff, p. 257.

These weighings were made upon a pair of fine analytical scales belonging to the chief chemist of the Board of Health of Brooklyn, and are taken to one-tenth of a milligram, or one-six-hundred-and-fortieth of a grain. There was a gain in every bottle compensating for evaporation, from eight and seven-tenths milligrams in the lowest to fifty-two and six-tenths milligrams in the highest. The amount of growth in each bottle, while appearing to the eye in bulk as ranging with these figures, scarcely seemed to bear their exact proportions. No. 5, while larger than No. 3, did not appear to be six times its bulk. It was, however, more compact, and looked to be double the volume. Had there been five of the water, and a mean of both sets taken, the results would have been more satisfactory. This was not thought of until too late.

FIG. 67.

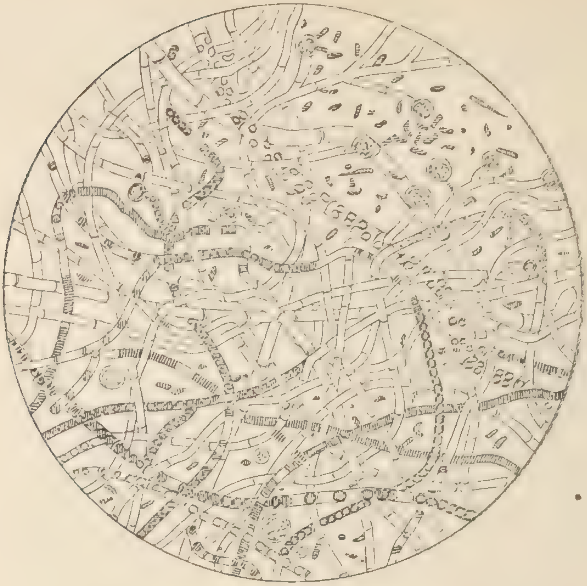


From Sulphate of Strychnine.

WHAT THE MICROSCOPE REVEALS.

When a powerful microscope is used in the study of these plants, a new and strange wonder-world is opened up. These pictures are somewhat fantastic in color, and only aim at pointing out morphological differences by contrast. The objects are colorless, except the amber spores from old sporidia, these green ones from sulphocyanate of potassium, and the purple blots seen in the specimens from orange-flower water. When bright sunlight passes through an Abbe condenser upon them, their gorgeous diffraction and refraction colors are as beautiful as they are illusory. Under the proper focus, a delicate pink and green appear as refraction colors along the filaments. These views are not reproductions from a single focussing, such as as would appear in a micro-photograph. They are made to follow the fibres as they dip and rise, bringing them out upon a level. The objective used was a Zeiss $\frac{1}{12}$ homogenous oil immersion, numerical aperture 1.30, angle 117° 34′, and penetrating power of only .769. A faithful reproduction of a single focussing would therefore give but a sorry idea of what they look like. When using low powers having high penetrating power (as in illustration *A*, from muriate of cocaine, Fig. 71), they can be drawn just as seen with the best effect. Here an increase of 175 diameters was made, and the whole plant, as it swam upon the surface of the water, sketched and subsequently enlarged. These drawings give only an idea of the rough exterior. They cannot picture the motion, life and activity. These free zoospores appear as if endowed with an independent will, and act exactly like living animals. To watch their whirling, twisting, tumbling, wriggling and crawling, is exceedingly interesting. Now they are spinning like a top, with only the tips visible, and anon writhing like a serpent at full length. At one moment you see them swimming about in the solution ; at another they attach themselves to a branch as a leech would to an animal's limb, where they hang and twist. Ether puts them to rest for a spell, but they soon begin their activity again, if the quantity used was small. Nor are the branches themselves entirely at rest. When the time of conjugation (sexual union) comes, their loose, disorderly arrangement disappears and the branches approach a parallelism. Then the terminal points of the branches bend aside toward each other, touch and interlock. One opens, the other enters, and soon they are one. Here (in illustration *D*, of cocaine) we have the preparatory appearance before the wedding. It is marvellous to see at the very base of the tree of life so many mute signs displaying something wonderfully suggestive of sensation. Conjugation is said to occur along the joints, but it has not been my good fortune to see it. During this investigation, the meeting and union of ends here described has been seen in dilute phosphoric acid, Fig. 68, and cocaine only. After they part, the ends fill with spores and swell out in large round asci or pockets, as is seen in a number of the drawings. When detached and ruptured some of them look like a flower. This one in orange-flower water, Fig. 69, is quite pretty. Bacteria fructify in the same manner as here shown. Koch has never been able to produce the round sporidia in his comma bacilli. Dr. Ferran pretends to have done so, and bases his vaccinations on the efficacy of the spores. The drawings you observe show the various stages in the segmentation of the protoplasm. Koch says his "commas" develop solely in this manner. During the progress of this division some filaments can be seen with continuous protoplasm within them, others are broken up into long pieces, others short, and many are round like peas. Finally they force themselves through

FIG. 68.



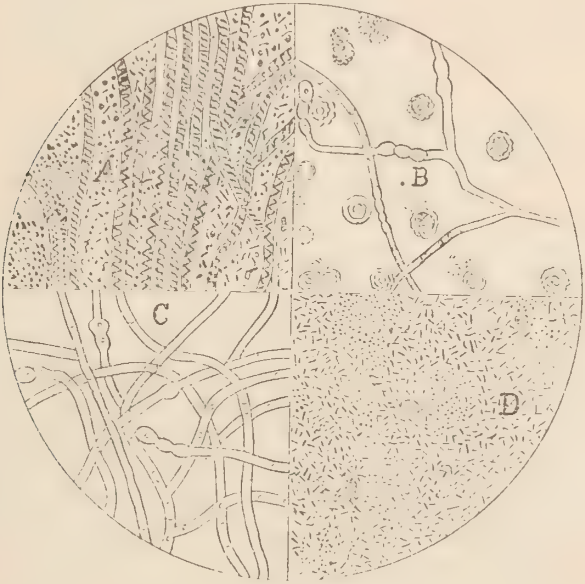
From Dilute Phosphoric Acid.

openings in the sheaths, and come out in characteristic shape to begin their wanderings as zoospores. It is no uncommon thing to find a number of them imprisoned within their cells by the closing of the points of egress. The filaments all being jointed like corn or grass, and a septum intervening at each joint, they are limited in locomotion. To see them go from end to end, and up and down, reminds one of caged animals in a menagerie. As many as three are sometimes thus imprisoned together, and their movement in passing each other is very much like boys playing a game of leap-frog. Among the largest of them may be observed all the changes of an amœba sending out pseudopodia. These imprisoned zoospores are seen most plainly in the drawing from sulphate of strychnine Fig. 67. The free zoospores, as well as the sporidia from different solutions, differ in appearance. In orange-flower water, when alive, they are perfect spirilla, and when dead look like Koch's commas. In phosphoric acid, at some stages, they resemble anthrax, but the usual appearance is best pictured by maggots or larvæ of flies in decaying matter. They all, after a brief motile existence, come to rest. Many die, but others (and occasionally before motion has ceased) begin to elongate into their destined vegetable forms. Their motion is due to invisible cilia, as can be seen by staining with iodine. Their bodies show from one to four nuclei, and when stained nucleoli. In a number of cultivation experiments to determine how and where they would grow, it was found that those from phosphoric acid developed in strychnine and orange-flower water, but no growth from any other solution has been found capable of appearing in the former unless very weak. The solutions with which these experiments were tried first were boiled, then cooled, and lastly infected.

HEAT KILLS THEM.

No kind yet found can stand raising to 212° F. It kills every time. The worst samples are completely sterilized by this treatment, and only require to be kept securely corked afterwards. This temperature can do no great harm to any aromatic water, dilute phosphoric acid, citric, tartaric or oxalic acids, or the salts of strychnine, pilocarpine, and morphine. For cocaine, eserine, and atropine it is inadmissible; such a heat would destroy these salts. A temperature of 140° F. maintained for an hour, or being merely raised to this point three times at intervals of two or three hours, had the effect of sterilizing as effectually as boiling.

FIG. 69.



From Orange-flower Water.

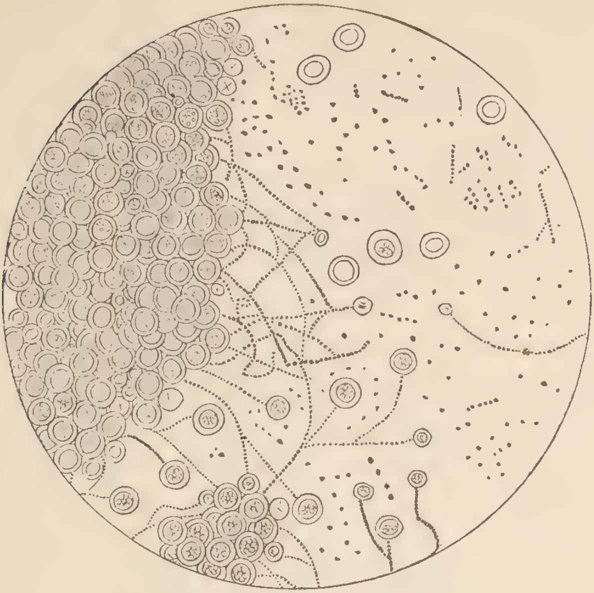
SOURCES OF INFECTION.

These methods of destroying the spores were used in determining the sources of infection. The old bottles in which broken-down solutions had been kept, and the distilled water that had been transferred to the same receptacles for a series of supplies without antiseptic cleaning, were by all odds the worst. When everything was sterilized but the stock bottle, the new solution invariably broke down in a few days. Even after careful rinsing, a week would scarcely elapse before they would appear. If antiseptically cleaned, securely corked, and full, it would keep unaffected indefinitely. In sixteen solutions of boric acid, ranging in strength from one in two hundred and fifty to one in fifteen hundred, the fourteen weakest of which were prepared from freshly distilled water collected with antiseptic precautions, and the two strongest from distilled water purchased from a wholesale dealer, not one of the former broke down in two months, but both of the latter contained the plants in ten days. The bought water was full of spores. Sterilized bottles that had been kept corked for two months, and in which nothing grew, have occasionally broken down after being opened two or three times. Here we have proof that the air itself is a source of infection. This fact was repeatedly confirmed in the experiments to determine the value of antiseptics for protecting these solutions. Bottles that were supposed to be protected would break down after free exposure to air.

EXPERIMENTS WITH ANTISEPTICS.

In the experiments here referred to there were twelve different kinds of solutions tried with six antiseptics of eight varied strengths. This made a total of 576 tests, and required just four gross of vials. The filling of these was a tedious task. The solutions and strengths were, orange-flower water diluted, ½; codeine, one part in 250; eserine sulph., 1 in 1000; pilocarpine muriate, 1 in 500; atropine sulphate, 1 in 1000; morphine sulphate, 1 in 500; morphine muriate, 1 in 500; cocaine muriate, 1 in 200; strychnine sulphate, 1 in 200; strychnine acetate, 1 in 100; citric acid, 1 in 60; and tartaric acid, 1 in 60. The cocaine would have been tried in two or three per cent. solutions if the price had been ten cents per grain before, instead of after, the experiments were started. Seven dollars was all that could be afforded for one article, and none of the manufacturers offered assistance. The antiseptics used and strength in each of the eight vials were, for boric acid and salicylate of sodium, 1 part in 25, 50, 100, 200, 300, 400, 450, and 500; for benzoic and salicylic acids, 1 in 500, 750, 1000, 1500, 2000, 2500, 3000, and 4000; for camphor, 1 in 1000, 1500, 2000, 2500, 3000, 3500, 4000, and 4500; for corrosive sublimate, 1 in 20,000, 30,000, 40,000, 50,000, 60,000, 70,000, 80,000, and 90,000. The details of all these experiments would be a dry and uninteresting statement to listen to. One set only has been tabulated, to show the irregularity of their appearance. Fig. 1 is the strongest and Fig. 8 the weakest in antiseptic. Boric acid is the one given. Fig. 1 is therefore 1 in 25, or 4 per cent. and Fig. 8 is 1 in 500, or ⅕ of 1 per cent. "I" stands for infected. This agent was an entire disappointment. It was first tried with dilutions running as low as 1 in 1500, but these had to be abandoned. In the table here given the highest preserved were tried by infecting, so

FIG. 70.



From Sulphocyanate of Potassium.

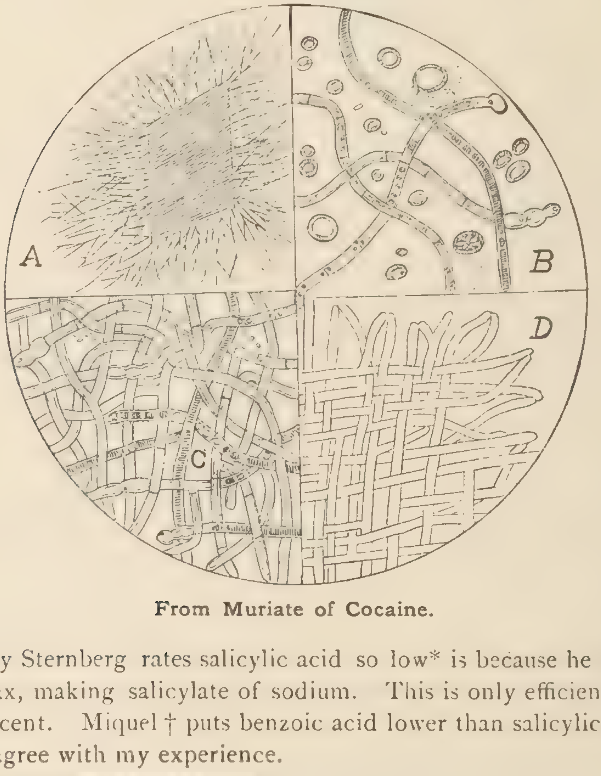
that several of the "I's" are due to artificial, not spontaneous, growing. Blank spaces were free from growths. Those from 4 to 8 received no artificial infection. On scanning the table it will be seen that two broke down at 1 in 50, leaving 1 in 25 as their point of safety; nine at 1 in 100, leaving 1 in 50 as theirs; and two at 200, leaving 1 per cent. as the strength to save them. Except as a matter of curiosity, the strongest one to break down is the only one that needs our attention. The blank before it is the point of safety. All other blanks are but accidents, and count for nothing.

Boric Acid.	1.	2.	3.	4.	5.	6.	7.	8.
Atropia sulph	. . .	. . .	I.	I.	. . .	I.	. . .	I.
Codeine	. . .	. . .	. . .	I.	I.	. . .	I.	I.
Cocaine mur	. . .	I.	I.	I.	I.	. . .	I.	. . .
Citric acid	. . .	. . .	I.	. . .	I.	I.	I.	I.
Eserine sulph	. . .	. . .	I.	I.	I.	I.	. . .	I.
Morphine mur	. .	. . .	I.	. .	I.	I.	. . .	I.
Morphine sulph	. . .	. . .	I.	. . .	. . .	I.	I.	I.
Orange flower water . . .	. . .	. . .	I.	I.	I.	. . .	I.	I.
Pilocarpine mur	. . .	I.	. . .	I.	. . .	. . .	I.	. . .
Strychnine acet	. . .	. . .	. . .	I.	I.	. . .	I.	I.
Strychnine sulph	. . .	. . .	I.	. . .	. . .	I.	. . .	I.
Tartaric acid	. . .	. . .	I.	I.	. . .	I.	I.	I.

The next table is a complete synopsis of all the experiments. The figures represent the amount of solution in parts into which one part of the antiseptic was put. We have only to glance at it to see that benzoic acid, salicylic acid and camphor have nearly the same power of destroying these growths. Benzoic acid is a little ahead of the other two. The reason why Sternberg rates salicylic acid so low* is because he dissolved it in borax, making salicylate of sodium. This is only efficient in from 2 to 4 per cent. Miquel † puts benzoic acid lower than salicylic, but this does not agree with my experience.

Name.	Boric Acid.	Benzoic Acid.	Camphor.	Mercuric Chlor.	Sodium Salicyl.	Salicylic Acid.
Atropia sulph.	50	2,500	2,000	90,000	50	2,000
Codeia	100	2,500	2,000	90,000	25	2,500
Cocaine mur	25	2,500	2,500	90,000	25	2,500
Citric acid.	50	2,000	2,000	90,000	25	2,000
Eserine sulph	50	2,500	2,500	90,000	25	2,500
Morphia mur	50	3,000	2,500	90,000	25	2,500
Morphia sulph	50	2,500	2,000	90,000	25	2,500
Orange-flower water. .	50	2,500	2,000	90,000	25	2,500
Pilocarpine mur . . .	25	2,500	2,500	90,000	50	2,500
Strychnia acet	100	2,500	2,500	90,000	50	2,000
Strychnia sulph. . . .	50	3,000	2,500	90,000	25	2,000
Tartaric acid. . .	50	2,500	2,500	90,000	50	2,000

FIG. 71.



From Muriate of Cocaine.

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* "Bacteria," Sternberg's Magnin, p. 229.

† *Medical Record*, vol. 24, p. 498.

Mercuric chloride heads the list. The smallest amount used was 1 part in 90,000, and not one broke down, even by direct infection. It is quite probable that one 1 part in 100,000 will be enough. The proportion of the table is as one grain to nearly a gallon and a half. Benzoic acid, salicylic acid, and camphor require from thirty to fifty grains for the same amount. Strong solutions of any given drug require a smaller quantity of the antiseptic. If a number of such of varying strengths stand side by side, and are subjected to apparently identical conditions, the averages among their infected ones show that the weaker they are the more susceptible they are; this, of course, within limits. It is a well known fact that concentrated phosphoric acid will not break down, while dilute will, and the less the proportion of acid, other things being equal, the quicker these growths appear. Five per cent. solutions of citric acid are almost perfectly protected, but when weakened to twelve or less they become very susceptible. Cocaine solutions of 4 per cent. are said to break down much faster than those of 20 per cent.* As a protective for cocaine, boric and salicylic acids have been mainly relied upon. Dr. Squibb prefers the latter, as the quantity required is so much less than of the former. He uses it in the proportions of 1 to 600. One-quarter of this strength would be sufficient. About one grain to every two and one-half ounces is enough. This acid is certainly preferable to boric, but why it should take precedence of benzoic is not so clear. The latter acid requires even less, is scarcely, if at all, irritable in the strength required, and makes no unsightly color with traces of iron. It seems to be the very best antiseptic we have for protecting medical solutions where prejudice or fear forbid the use of corrosive sublimate, and where this agent is precipitated as calomel. For collyria it only needs to be tried to become a favorite. In the preservation of fruit juices from fermentation, it leaves scarcely anything to be desired. Taken internally it has none of the cumulative ill effects of salicylic acid. Patients with diseases of the kidneys or bladder are benefited, not injured, by its use. It is cheap, harmless and efficient. Corrosive sublimate in many places is preferable to anything else as an antiseptic, and will no doubt be a favorite in the future. At present it must outgrow the prejudice in the public mind against all mercurials, and especially against one so poisonous. In the excessively minute quantities required, its physiological effects are much like those of iron. It increases the number of red blood-corpuscles and gives tone to the system.

There are many other antiseptics which have at various times been commended as good preservatives of aqueous solutions, such as thymol, chloral, creasote, phenol, etc., which ought to have been investigated in connection with the list presented. Had the work been begun a year ago, instead of within the last three months, much more might have been accomplished, and what has been done would have been more convincing. The whole subject has been so sadly neglected in the past, and so hastily worked over now, that scientific accuracy is out of the question. These results must only be taken as provisional until corrected or confirmed by future investigators. It is to be hoped that those whose views run counter to the conclusions here drawn, in any particular, will take this as a stimulus prompting them to work so as, if possible, to sustain their side. The harmony of the spheres is maintained by a balance of contending centrifugal and centripetal forces. Let counter ideas clash, and a tendency to work and thought arises. It makes no difference to me whether we have algæ or fungi to deal with, or whether they are ferments or not. Whatever they are, we want to know. By working the subject over faithfully, practical points of great value must be discovered, and these, even those who do not work for the advancement of knowledge can appreciate.

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* *Lancet*, 1885, p. 224.

NOTE ON THE FUNGOID GROWTH IN DILUTE PHOSPHORIC ACID.*

BY L. E. SAYRE.

Two half-gallon bottles of dilute phosphoric acid were prepared, one lot being made from phosphorus, the other from the glacial acid. The acid strength of the solutions was determined, and they were then set aside for eleven months, when the liquid prepared from the glacial acid was found to have by far the largest amount of fungoid growth. The acid strength of neither solution was diminished; testing them by the ordinary method, the same percentage of free acid was found after this long standing as when freshly made.

Professor Formad informed me that this fungoid growth was not of a poisonous or deleterious nature.

ASSAYING TINCTURE OF OPIUM.†

BY WM. W. BARTLET.

QUERY No. 19.—*What is the proper method for assaying tincture of opium where the U. S. P. is the legal standard for drugs?*

The Pharmacopœia of 1880 gives no method for the assay of tincture of opium, but gives a method for the assay of opium, and a standard for its morphine strength. The Pharmacopœia leaves the question of morphine strength of tincture of opium somewhat open, but leaves one to infer that as it is made from opium of from 12% to 16% morphine strength, and that as ten parts of this opium are used in every one hundred parts of tincture, the tincture should assay from 1.20% to 1.60% of morphine by the officinal process. That is, if we use opium of 12% morphine strength, the tincture should assay 1.20% of morphia; and, if 16% opium is used, the tincture should assay 1.60% of morphia, which is not strictly the case. For, if the powdered opium be strictly uniform (which is not always the case), the tincture will fall slightly below this strength. Hence, if we make our tincture from opium assaying 12% of morphine, our tincture will fall below the standard of the U. S. P., and it is not safe to use the minimum strength of U. S. P. opium in the pharmacopœial quantity for making the tincture.

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* Read at the Third Session.

† Read at the Third Session.

My experience has been that the U. S. P. process for making tincture of opium does not thoroughly exhaust the opium of morphine.

The only safe way therefore to make tincture of opium is to make a tincture that assays much higher than 1.60% of morphine, as for instance 2% or even more. Then assay this tincture and reduce it with dilute alcohol to the standard of either 1.20% or 1.60% of morphine, or any intermediate strength. By proceeding in this way either moist or dried opium could be used. The standard of the U. S. P. for denarcotized opium being 14% morphine, I would recommend that the tincture be reduced to a uniform standard of 1.40% morphine strength.

I would suggest to the next Committee on the Revision of the Pharmacopœia that under the head of tincture of opium, instead of directing simply to take so much powdered opium, that powdered opium of at least 16% morphine strength be taken, or the equivalent of a weaker opium; that the tincture be then made as now, and that the finished product be assayed, and then be adjusted with dilute alcohol so that it shall contain 1.40% of morphine.

So long as the tincture of opium is to be assayed, the cheapest method of manufacture would be to use moist opium; and assuming that it contains 9% of morphine, use sufficient quantity to make a tincture containing 2% of morphine—thus using of the moist opium a little more than double the amount called for by the Pharmacopœia in the powdered form. Then cut it into small pieces and macerate it with one-third of the quantity of the hot water with frequent agitation for three days, express, add another third of the hot water, macerate, agitate, and express as before, then repeat the operation with the last third of the hot water. Mix the infusions and set aside. Then repeat this operation, using alcohol instead of the hot water, and mix them well together, and mix with the mixed infusions. Filter, assay and adjust to the standard of 1.40% of morphine.

The method of assay for tincture of opium which I have found to give the best results is as follows:

Take of tincture of opium seventy grammes, representing seven grammes of powdered opium. This may be weighed in a beaker, if the scales are too small to hold a capsule of this size, and then transferred to a porcelain capsule, washing out the last portion with two successive portions of dilute alcohol. The tincture is then evaporated in a porcelain capsule of about four ounces capacity, at a temperature not exceeding 85° C., till it ceases to lose weight. Then the lime and the 20 cc. of distilled water are added, and the whole allowed to macerate in the evaporating dish, and not a mortar, for at least one-half hour. At the end of this time the mixture should be well stirred, and the 50 cc. of distilled water added. This is then allowed to macerate for another half hour, stirring occasionally during the half hour. The mixture is then filtered through a plaited filter, which I found more convenient to have *five inches* in diameter than "three to three and one half inches," as directed by the Pharmacopœia. Having thus prepared the tincture for assay, it is now ready to be completed by the remainder of the process of the Pharmacopœia, as modified in my paper on the assay of opium, read at the last meeting of the Association.

ASSAYING TINCTURE OF OPIUM.*

BY EDGAR L. PATCH.

QUERY NO. 19.—*What is the proper method for assaying tincture of opium where the U. S. P. is the legal standard for drugs?*

The liquid preparations of opium are to be made from the officinal powdered opium that yields not less than 12 % nor more than 16 % of morphine by a given process of assay.

It would seem proper that the *preparations* should be assayed by the same process as that employed in determining the quality of the powdered opium used.

The U. S. P. fixes upon 14 % morphine strength for denarcotized opium, and, to secure uniformity, it would be well to make this the standard for powdered opium also, thus fixing a definite morphine strength for the preparations.

Then a weighed quantity of any preparation, equivalent to a definite quantity of opium, may be evaporated to dryness and proceeded with as directed in the officinal process.

Watching a number of inexperienced operators working by this process, the following errors in manipulation were observed:

Starting with 70 grams of tincture of opium, equivalent to 7 grams of powdered opium, and evaporating in a porcelain capsule by direct heat, the opium has been overheated, and its yield of morphine diminished.

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* Read at the Third Session.

Or, evaporated by water-bath, it has been evaporated to the condition of a *thick extract* only, enough water being left to diminish the per centage of morphine.

A better plan is to evaporate in a drying-oven, at a temperature not exceeding 85° C. (185° F.), until it ceases to lose weight.

Another error consists in attempting to remove the dry extract from the capsule to follow the literal directions of the Pharmacopœia, "triturate in a *mortar*, etc."

A quantity of the extract is lost by inexperienced manipulation for this purpose.

Instead, let the lime and 20 cc. of water be added to the hard extract in the capsule, allow the mixture to stand a few minutes until the extract softens, then stir with a glass rod until a uniform mixture results (all of the extract being dissolved), then add the remaining 50 cc. of water, and proceed.

A minor error consists in using lime that has been exposed to the air until partially carbonated, or, the "freshly slaked lime" is weighed containing an excess of water.

Considering morphine meconate to consist of two molecules of morphine and one of meconic acid, about 138 mg. of calcic hydroxide would be required to decompose the morphine meconate present in 7 grams of opium yielding 16% of mono-hydrated morphine (other native combinations of morphine not taken into account).

About 170 mg. of calcic hydroxide would be required to place the liberated morphine in solution, allowing over five-sixths of the calcic hydroxide for uniting with the coloring matter, etc. A select piece of quicklime weighing about 10 grams moistened with not more than four or five cc. of water and allowed to stand until vapor ceases to be given off, will produce a dry, pulverulent hydroxide.

The "ammonium chloride" used should be examined for sulphate and carbonate (the writer found a package labeled "Pure Granulated Chloride of Ammonium" to contain a notable quantity of carbonate, probably an accidental and uncommon impurity).

The presence of sulphate and carbonate will increase the weight of the ppt. by the addition of calcic sulphate or carbonate to the morphine.

An excess of ammonium chloride is used, insuring the removal of the lime as calcic chloride, if the salt is pure. Preference should be given to the stoppered flask over the wide-mouthed bottle, as it usually favors better graduation and the easier separation of the ppt. alkaloid.

The employment of common graduates for graduating the flask, and for measuring the water used, is liable to lead to considerable variation in results. Either the burette, or 20 cc. and 50 cc. pipettes should be used.

During the evaporation of the ethereal portion, the funnel should be covered to prevent the rapid evaporation of the ether from the upper portion of the filter, leaving a marked ring of narcotine, etc., requiring more than the prescribed quantity of ether to wash out.

After a little practice, it is an economy to divide the pharmacopœial quantity into two equal portions, one serving as a check assay.

The objection, that the smaller the quantity operated with the greater the error of result, is undoubtedly a valid one, but careful manipulation will go far to offset it.

I would provide two 60 cc. chemical flasks, graduated with the burette or pipette at normal temperature (25° C. or 77° F.), for 25 cc. Treat each portion as follows:

Evaporate 35 grams of tincture of opium to dryness in a three-inch porcelain capsule, add 1.5 grams freshly-slaked lime (dry) and 10 cc. of water (measured with burette or pipette), allow to stand until the extract softens, stir with a small glass rod until a uniform mixture results, add 25 cc. of water (measured as before), and stir occasionally during half an hour.

Filter the mixture through a plaited filter, having a diameter of about *60* millimetres (about half the *maximum* AREA suggested by the U. S. P.), into the graduated flask, until the filtrate reaches the level of 25 cc.

Add 3 cc. of alcohol and 15 cc. of stronger ether; stopper the flask with a smooth velvet cork, previously moistened with water and fitted to the flask, and shake the mixture.

Add 1.5 grams of pure ammonic chloride; shake well and frequently during half an hour, and set aside for twenty-four hours.

Counterbalance two small filters, about 50 millimetres in diameter; place one within the other (not plaited) in a small funnel, arranged to be covered. Moisten the filters with a little ether, and at once decant the ethereal layer from the flask upon the filter, covering the funnel during filtration. Add 5 cc. of stronger ether to the contents of the flask, rotate the flask, and again decant the ethereal layer from the flask upon the filter. After the ethereal layer has all passed the filter, wash the filter with 5 cc. of stronger ether, delivered in a very fine stream from a pipette with small orifice, permitting the ether to first fall upon the upper portion of the filter.

After washing the filter with ether, allow it to stand exposed to the air until dry.

Transfer the crystals to the filter; wash the flask and filter with 5 cc. of water in small portions; drain, dry at a temperature below 140° F. (60° C.), and weigh, counterbalancing the inner filter by the outer. Multiply the weight of the crystals in grammes by 40 (*forty*) to obtain the percentage of morphine.

To detach the crystals adhering to the sides of the flask, use a small bended solid glass rod, having a piece of thin rubber tubing stretched over the bended end. (The crystals are less liable to adhere if the flasks are *thoroughly* shaken after adding the ammonic chloride.) To facilitate washing the flask and filter thoroughly with the 5 cc. of water, use a small pipette with flexible tip, having a very fine outlet. The following results were obtained by this method of assay:

No. 1. A lot of green opium, dried and powdered: the powder gave 10. 8% morphine.

7500 grams of tincture of opium made, using enough of the opium to be equivalent to a 14% opium.

A. Assay = 13.2%. *B.* Assay, 13.6%. Mean of two, 13.4%.

No. 2. Opium dried and powdered, and powder assayed.

A. Assay, 12.6%. *B.* Assay, 12.8%. Mean, 12.7%.

7500 grams of tincture of opium made to represent 14% of opium.

A. Assay, 13.8%. *B.* Assay, 14%. Mean. 13.9%.

No. 3. Opium dried and powdered, and powder assayed.

A. Assay, 14.8%. *B.* Assay, 14.8%. Mean, 14.8%.

7500 grams of deodorized tincture of opium made to represent 14% opium.

A. Assay, 13.4%. *B.* Assay, 13.12%. Mean, 13.26%.

No. 4. Opium dried and powdered, and powder assayed.

A. Assay, 11.9%. *B.* Assay. 12.3%. Mean, 12.1%.

7500 grams of tincture of opium made from 12.1% and 14.8% opium, mixed to represent 14% opium.

A. Assay, 13.8%. *B.* Assay, 14.2%. Mean, 14%.

No. 5. Opium dried and powdered, and powder assayed.

A. Assay, 10.1%. *B.* Assay, 10.3%. Mean, 10.2%.

7500 grams of deodorized tincture of opium, made to represent 14% opium.

A. Assay, 13.56%. *B.* Assay, 13.76%. Mean, 13.66%.

No. 6. Opium dried and powdered, and powder assayed.

A. Assay, 12.4%. *B.* Assay, 12.2%. Mean, 12.3%.

75 grams of tincture of opium made to represent 14% opium.

A. Assay, 14%. *B.* Assay, 14.4%. Mean, 14.2%.

A sample of Squibb's powdered opium marked to contain "about 17% of morphine" was assayed by the U. S. P. process, and yielded 15.23%. Assayed by the process recommended by Dr. Squibb, it yielded 16.9%.

These results may go to show that while the U. S. P. process is the simplest and best for the pharmacist to use, it does not account for quite all the morphine present.

Again, all the alkaloid may not be extracted in making the preparations, and hence the alkaloidal strength should not be based upon the % strength of the opium used, but upon direct assay.

A fluid ounce of *tincture of opium*, U. S. P., 1880, measured in an ounce conical graduate that had been tested and determined to contain a wine fluid ounce of 455.69 grains of distilled water at 60° F., weighed 28 grams or 432.09 grains. It represented 43.20 grains of opium. If the opium contained 14% of morphine, the fluid ounce of laudanum contained 6.04 grains of morphine.

A fluid ounce of *deodorized tincture of opium* weighed 28.65 grams or 442.12 grains, representing 44.21 grains of opium, or 6.19 grains of morphine.

A fluid ounce of *wine of opium* weighed 29.3 grams or 452.12 grains, representing 45.21 grains of opium, or 6.32 grains of morphine.

Bearing in mind the difficulty of twice measuring *exactly* the same quantity in such a graduate, the variation of a few grains, which might be easily made, does not wholly vitiate these last comparisons.

ON THE COLORING OF ELIXIRS.*

BY JAMES W. CALDWELL, DETROIT.

QUERY No. 3.—*What advantage is there in coloring certain elixirs? For example, elixir of valerianate of ammonium?*

After nearly a year's study of this subject, I can see no advantage directly in the artificial coloring of any elixir, and it would be a great relief to the pharmacist could all elixirs be left in their natural state, so far as color is concerned. But such a thing would be next to an impossibility. Every pharmacist has an idea of what best suits his trade, and in the majority of cases follows after some leading manufacturer of elixirs, which often compels the pharmacist to color certain elixirs that otherwise would be colorless. Perhaps this is not so much to please the eye of the pharmacist as that of the physician, who in nine cases out of ten prefers an elixir with a color. As long as the present state of things exists, the pharmacist will be obliged to color many elixirs that would be colorless in their natural state.

As regards the particular color, that must be left with the pharmacist, but it certainly is best not to *over-color* the article. A tint is all that is required to give an elegant appearance; deep-coloring is unsightly. The colors most desired can be obtained by the use of caramel, cudbear and cochineal, and in some cases annatto.

The following elixirs may well be colored red: bromide of ammonium, valerianate of ammonium, valerianate of ammonium with cinchona alkaloids (when a salt of iron enters, no further coloring is required), iodide of arsenic and mercury, citrate of caffeine, hydrate of chloral, valerianate of quinine, valerianate of quinine and strychnine, bromide of potassium, bromide of sodium, valerinate of strychnine, and valerianate of zinc.

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* Presented at the Fourth Session.

The following elixirs to be colored with a tincture of cudbear: monobromated camphor, acetate of potassium, arsenite of potassium, iodide of potassium, salicin, salicylic acid, arsenite of sodium, and iodide of sodium.

The following elixirs to be colored with a tincture of annatto, which produces an amber tint: citrate of ammonium and bismuth, pepsin and bismuth, pepsin, bismuth and strychnine, pepsin and citrate of lithium.

Elixirs containing cinchona alkaloids I would prefer to color with caramel.

QUININE IN ELIXIR.*

BY JOSEPH FEIL, PH. G.

The elixir and its almost endless congeners have come to stay. There are numerous reasons for this fact: many of them are more palatable than other liquid preparations of the same drug; with very rare exceptions they are permanent and subject to insignificant changes by age or oxidation, and they belong to that category of medicaments which furnish ready-made prescriptions for almost every ailment, and, therefore, are very popular with many practitioners and druggists.

Formerly most of these compounds were made by the manufacturing chemists, and purchased at a good round profit by the retailer; but within the past few years, owing partly to the publication of more or less complete elixir formularies, their manufacture has been undertaken by very many retail pharmacists. We ought to have perfect uniformity in the formulæ of these compounds: the reasons for this are evident enough to every one, but how to accomplish so desirable a result is not quite so evident. Several methods suggest themselves, such as the nationalization of the now deservedly well-known N. Y. and B. formulary, the adoption of a new series of standard elixir formulæ by this Association, or, what I believe to be still better, the incorporation of such standard and every-day used elixirs as calisaya, calisaya and iron, quinine, iron and strychnine, beef, wine and iron, etc., etc., in the U. S. P., 1890.

The formulæ of many of the popular elixirs, as found in the various publications and drug journals, as a general rule, yield good results, but some among them are still an opprobrium to the art of elixir compounding; prominently among these are the elixir of quinine, iron and strychnine, and the various other elixirs containing quinine salts.

Very many formulæ have been published for these compounds, and from personal experience, I must say that with scarcely an exception they are of faulty construction, complex in manipulation, and unsatisfactory in result. The chief cause of all these troubles lies in the fact that the wrong quinine salt is used: if in place of the ordinary quinine sulphate, or as some recent formulæ direct, quinine alkaloid, quinine hydrochlorate be used, all difficulties vanish.

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* Read at the Third Session.

Quinine hydrochlorate is soluble at 15° C. (59° F.) in 34 parts of water and in 3 parts of alcohol, and its ready solubility is its great advantage.

The following is a ready method for preparing the much-dreaded elixir of quinine, iron, and strychnine with this chemical:

Iron pyrophosphate or phosphate (U. S. Ph. '80) . . .	256 grains.
Quinine hydrochlorate	64 or 128 grains.
Strychnine sulphate	1 or 2½ grains.
Alcohol or aromatic spirits	4 f.ozs.
Simple syrup	6 f.ozs.
Water, or any aromatic water	6 f.ozs.

Dissolve the alkaloidal salts in the alcohol, add the syrup, mix, and then add the water, in which previously dissolve the iron salt. When preparing the elixir with 128 grains quinine hydrochlorate to the pint, always fully neutralize the iron solution with aqua ammoniæ before adding it to the other ingredients. Made in the above manner, this preparation will not precipitate, and is precisely what it claims to be—a statement which cannot be made of many of the ready-made elixirs of the market. All other elixirs to contain quinine can be made as readily as the example quoted.

If the quinine hydrochlorate is not on hand, a solution of it can be readily prepared containing enough of the salt for one pint elixir quinine, iron and strychnine, by dissolving 140 grains quinine sulphate in 4 f.ozs. boiling alcohol and adding 18 grains sodic chloride dissolved in 1 f.dram water, and filtering from the precipitated sodic sulphate.

Quinine hydrochlorate is about ten per cent. stronger in alkaloid than the quinine sulphate.

ON ELIXIR OF CALISAYA BARK.*

BY EDMUND BOCKING, WHEELING, W. VA.

QUERY NO. 50.—"*Mixtures of Elixir Calisaya and Citrate of Iron vary in color and appearance. A paper on the subject is desired.*"

The above query, as it reads in the Proceedings of the A. P. A., led me to make a number of experiments, but in all cases I found the color the same, a dark inky-looking mixture, without any deposit, whether the elixirs were made from true yellow calisaya bark or the lower grades of bark.

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* Read at the Fourth Session.

By some mistake of the printer or some one else, the words "and quinine" were left out in the query, so it should read "Mixtures of elixir calisaya and citrate of iron and quinine vary in color and appearance. A paper on the subject is desired."

This query originated in a conversation with a number of members at our Milwaukee meeting. Before giving the result of my experiments, let me briefly state the circumstances that led to this query.

A prescription was brought to the store, that called for two scruples of citrate of iron and quinine and two ounces of elixir calisaya; it was put up, and returned by the patient to the physician, saying that it was not put up correctly, which was promply denied by me. The patient being a jobbing druggist, went to his own store, prepared it, and the result was quite a different mixture in appearance. (Since then I have not had the pleasure of compounding any more prescriptions for him.) The patient, after taking one dose of the mixture prepared by me, claimed that it produced pain, diarrhoea and other unpleasant symptoms, which, however, continued for some time after he had taken only the one dose, while the physician for an experiment took the contents of the two-ounce mixture, which caused such an appetite that he had to lay in an extra supply of provisions, while his strength increased in proportion.

The physician called on another druggist and had it compounded; the result of the mixture was the same as the one put up by my friend the jobber. Knowing that I was in the right, and suspecting the cause of the difference in appearance, I requested two prominent pharmacists to make the mixture and report the appearance in color, which turned out precisely the same as mine. I sent out to several druggists and obtained a small quantity of their tincture cinchona, made the elixir, and in each and every case the colors were nearly the same as the one put up by the jobber and other druggist, namely, a dark, inky-looking mixture, due to the tannate of iron. In some cases the colors were a little lighter, while the ones put up by myself and the other two pharmacists were of a cloudy, muddy slate color. After having obtained several specimens of bark and first making a tincture from each according to the U. S. P. 1880, yellow cinchona, 20 parts; glycerin, 10; alcohol and water, q. s. to make 100 parts, and then making the elixir by formula published in the Proceedings of the A. P. A. for 1874: tincture cinchona, 22 drams, and simple elixir q. s. to make one pint—simple elixir being made by the formula published at the same time, viz: spt. orange, 2 drams (oil orange, sweet, 1 ounce; alcohol, 16 ounces); stronger alcohol, 16 ounces; cinnamon water and simple syrup, each 24 ounces.

RESULT OF EXPERIMENTS.

No. 1. Calisaya bark quill (cultivated), 6 per cent. total alkaloid and over 2 per cent. being quinine, cinchotannic acid 4 per cent., produced a mixture of a muddy slate color; after standing for a week formed a deposit of 50 per cent. in volume, of a dark slate color, the clear portion being of a dark green color.

No. 2. Common yellow cinchona bark, containing mostly lower alkaloids, cinchotannic acid $1\frac{5}{16}$ per cent., produced a deposit of 12 per cent. in volume, color light slate; liquid light green.

No. 3. Red bark, true quill, cinchona rubra (cultivated), containing 6 per cent. of total alkaloid, over 2 per cent. being quinine, cinchotannic acid 4¾ per cent.; produced 80 per cent. of a light slate deposit; liquid of a dark green.

No. 4. Cinchona bark cuprea, containing 4½ per cent. total alkaloid, 2 per cent. being quinine, cinchotannic acid 1¾ per cent.; produced a 50 per cent. reddish brown deposit; liquid, brownish.

No. 5. Red bark "R" cinchona, containing 3 per cent. total alkaloid, cinchotannic acid 2½ per cent.; deposit light slate color, 12 per cent.; color of liquid, dark green.

No. 6. Cinchona bark "Y," containing over 3 per cent. total alkaloid, cinchotannic acid 3¼ per cent.; color of deposit greenish slate, 30 per cent.; liquid, dark green.

No. 7. Cinchona bark (Loxa) not assayed for alkaloids, but containing cinchotannic acid 6¾ per cent.; color of deposit light slate, 25 per cent.; liquid, dark green.

The albumen test was used in obtaining the per cent of cinchotannic acid, and to be sure of the correctness of the per cent. I requested my friend Mr. J. M. Wayman also to try it. After he had tried numerous tests which did not prove very satisfactory, he finally made an infusion of the bark, coagulated the cinchotannic acid with albumen and acetic acid; the result was that we both obtained the same per cent. except in specimens No. 2, which he made three per cent, and No. 6 only two per cent. which, however, could not have any noticeable effect on the final result. He obtained it by the infusion, while I obtained mine by detannating the tincture with three drachms of albumen to two ounces of the tincture, not using any acid at all. Albumen, when dried, will yield from six drachms: twenty-six grains.

Result with the elixir from detannated tincture of the above-named barks:

No. 1. Gave a deposit of 95 per cent in volume, color slightly lighter than when not detannated, color of liquid also lighter.

No. 2. Deposit 8 per cent. in volume; liquid, greenish.

No. 3. Deposit 90 per cent., color greenish slate; liquid, greenish-black.

No. 4. Deposit 75 per cent., color light slate; liquid, brownish-green.

No. 5. Deposit 5 per cent., color greenish slate; liquid, dark green.

No. 6. Deposit 30 per cent., color dark slate; liquid, dark green.

No. 7. Deposit 20 per cent., color light slate; liquid, light green.

The per cent. of deposit in each specimen could have been easily obtained; but as it is not of any importance to the query, I did not make it, but only give the amount in comparative volume.

In all cases the shades varied somewhat, but those which were detannated gave a considerably lighter shade of deposit; also the clear portion of the liquid was considerably lighter in color; so it will be seen that even after the tincture has been detannated, the muddy slate color still exists; and that it must be due to the excess of quinine, as from the foregoing table it will be seen that Nos. 1, 3 and 4 contained more quinine than any of the others, and gave a larger amount of deposit than those not containing so much.

The mixture can very easily be cleared by the addition of aromatic sulphuric acid, other acids not giving any satisfactory result; but, as it requires too large a quantity to clear it, it would not be advisable to use it.

It has been admitted to me that those druggists whose mixtures produced the inky appearance did not follow the directions of the U. S. P. by taking the yellow calisaya bark in preparing the tincture, but that they take the red cinchona, or even a cheaper bark, while others make their tincture from the fluid extract of the red bark, and some make the elixir out of a mixture of quinine and cinchonidine and simple elixir, as published in Prof. J. U. Lloyd's book of elixirs (page 68), which he names elixir of cinchona bark, also elixir of calisaya; while a similar formula, more correctly named elixir quiniæ compositum, as found on page 21 of Unofficinal Preparations, adopted by the New York and Brooklyn pharmacists, gave a mixture clear and agreeable to the eye, while the elixir cinchona made by the New York and Brooklyn formula (page 7) gives a greenish yellow cloudy mixture.

Although when made strictly from the officinal tincture, it is not so pleasing to the eye as the elixir adopted by the New York and Brooklyn pharmacists, which is only lighter in color; yet, as the A. P. A. has adopted and published a formula for it, it ought to be recognized and used in preference to any other.

The officinal tincture yields upon evaporation sixteen and one-half grains of dry, solid extract, while the samples obtained from various drug stores yielded from one and one-half to five grains to the ounce.

If the druggist or pharmacist in making his preparations would, in all cases, proceed in strict conformity with the U. S. P., these unpleasant occurrences would be avoided; but when he loses sight of this standard authority, and uses a cheaper bark or fluid extract, having his eye fixed only on his pocket-book, such occurrences are inevitable.

As elixir calisaya, as well as many other elixirs, are much in use in all parts of the United States, I would suggest that the Committee on Revision of the U. S. P. adopt standard formulas.

PRESERVATION OF MUCILAGE OF ACACIA.*

BY THOS. W. WATKINS.

QUERY NO. 40.—*What is the best method of preserving mucilage of acacia?*

I will endeavor to write a few remarks that may be of some value, and perhaps lead to a more valuable paper on the subject.

Having had considerable experience with emulsions of the different balsams and oils, in which a mucilage of some kind is necessary, the idea suggested itself that a better way of preparing them could be devised than that of rubbing the mucilage, balsams and oils in the mortar. By this process it is necessary to have a mucilage of acacia always ready and in good condition. Prepared according to the U. S. P., it does not keep long in a condition suitable for dispensing. I suppose the object of the query is to obtain a process for preparing the mucilage so that the substance used as a preservative will in no way interfere with other ingredients, either chemically or therapeutically.

The following methods, of many investigated by me, were the best. Strength according to the Nat. Disp:

1st.	Tinct. tolutani	ʒj.
	Calcii phosph	q. s.
	Aquæ	℥viij.
	Acaciæ	℥iv.

M.—S. A.

Made June 27th; became sour in 15 days.

2d.	Ol. eucalypti	♏xv.
	Calcii phosph.	q. s.
	Aquæ	℥viij.
	Acaciæ	℥iv.

M.—S. A.

Made June 27th; showed signs of deterioration in 20 days.

3d.	Ol. gaultheriæ	♏xv.
	Calcii phosph.	q. s.
	Aquæ	℥viij.
	Acaciæ	℥iv.

M.—Secundum artem.

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* Presented at the Fourth Session.

The last has proven to be the best; it was made June 10th, and at the time of writing—August 8th—shows no signs of change either to the taste or smell; while the others, including a sample made according to the Nat. Disp., are cloudy, and of an acetous taste and smell. All the samples were exposed to the same temperature and light, and in vials not corked. I find it much easier and cleaner to dispense extemporaneous prescriptions of emulsions with the balsams and oils by measuring the latter and the mucilage into the vial and shaking them well. In closing, I would ask: If oil of gaultheria has preservative qualities (depending perhaps on methyl salicylate), why not add it to other preparations that spoil so quickly, such as syrupus acaciæ, syrupus simplex, etc., and to adeps, in place of benzoin?

PILLS OF POTASSIUM PERMANGANATE.*

BY EDGAR L. PATCH.

QUERY NO. 82.—*How can permanganate of potassium pills be best prepared? Give experiments with excipients.*

When we first had occasion to dispense permanganate of potassium pills, we chose that excipient nearest at hand seeming to meet the requirements of making a mass quite readily and preserving the salt from rapid decomposition.

This was resin cerate, and using the permanganate in very fine powder, the cerate met the first requirement so well, that we persevered in its use after Martindale had suggested the use of kaolin and paraffin, and Proctor kaolin and water.

We never kept the pills in stock, and argued that the comparatively slow solubility of the pills was of advantage in preventing the too powerful local action of the salt.

Even so, we had some customers ask if "the pills should cause distress in the stomach."

We also recommended resin cerate to others having stray calls for the pills, and who found difficulty in obtaining kaolin of their wholesaler.

Inquiry revealed the fact that at that time few wholesalers handled kaolin, and some who sold "China clay" informed their customers that they knew nothing of "kaolin."

"*Pure* kaolin is a white clay, a hydrated silicate of aluminium, having the formula $H_2Al_2Si_2O_8+H_2O$. Coming largely from China, where it is found near the Kauling mountains, it derives its name *Kaolin* from the locality mentioned. It is also found in France, Saxony, England, and various localities in America." (R. & S.)

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* Read at the Third Session.

Obtained from these different localities, its composition varies somewhat; ferric oxide, lime, magnesia, alkalies, and water, being present in varying proportions.

Hence samples differ in plasticity when mixed with water, and the many statements regarding its value as an excipient may be harmonized.

After experimenting with the various excipients that have been suggested, I would recommend one of the three following:

First. Resin cerate, in proportion varied according to the size of the mass, from 15% to 20% of the finely powdered permanganate used. Five grains will make a mass with twenty-five grains of the salt, fifteen grains will make a mass with one hundred grains of the salt.

Second. "One part of permanganate, one and a half parts of kaolin, and water q. s." (Proctor.) The amount of water required will vary from one-half to three-fourths of a part.

Third. Permanganate two parts, kaolin one part, and petrolatum q s. The amount of petrolatum required depends upon its consistence.

We commonly employ one-third of a part—as, permanganate 24 grains, kaolin 12 grains, petrolatum 4 grains, makes a mass somewhat more plastic than number one, and decidedly more so than number two, which has to be handled skillfully to get satisfactory results.

Of the three masses, number two, with kaolin and water, disintegrates rapidly in contact with water; number three more slowly, and number one the slowest of all. Of their permanence I am unable to speak from personal observation, as the thought of presenting any papers to the Association is of so recent origin, having its sudden birth in the earnest solicitation of the chairman on queries, that none of my masses are more than a month old; but we have it stated by Mr. Geo. Smith, Phar. Jour., 1884, that masses made with kaolin and paraffin lose 50% to 70% by decomposition, after six months' time.

In view of this the pills should be freshly made, and the pharmacist may work by any of the three formulas suggested, that best suits the case in hand.

PILLS OF NITRATE OF SILVER.*

BY EDGAR L. PATCH.

QUERY NO. 86.—"*A paper on the preparation of Nitrate of Silver pills is desired.*

We have had occasion to dispense nitrate of silver in pills, both alone and in combination, many times where a choice of excipient was not permitted. We well remember our experience, many years since, in attempting to follow the physician's directions literally and use powdered acacia and water (see Dorvault). The resulting elastic mass could not be moulded with any satisfaction, and the next time we were allowed choice of excipient, when one part of finely-powdered nitrate of silver and one part of lycopodium were well mixed and massed with extract of gentian.

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* Read at Third Session.

The result was every way satisfactory mechanically, and probably subject to less decomposition than many of the combinations in which the salt is employed.

Afterward resin cerate was substituted for the gentian, with the intention of making a more permanent mass. Such a mass, however, is not a mechanical success.

Subsequently powdered French chalk was substituted for the lycopodium, and an excellent mass resulted, cohesive, plastic and permanent. The amount of cerate required depends upon the fineness of the powders and the consistence of the cerate ; nitrate of silver and powdered French chalk, each two parts, and resin cerate, one part, usually meeting the requirements.

Kaolin may be substituted for the chalk, and petrolatum for the cerate, and a mass obtained that is equally good mechanically, while its chemical merits are above reproach, if we accept the statement of Mr. Geo. Smith (Phar. Jour., 1884), that pills of nitrate of silver massed with kaolin and the paraffins remain unaltered after eighty-five days.

Either of these masses, nitrate of silver and powdered French chalk (talc), each two parts, resin cerate, one part, or nitrate of silver and kaolin, each two parts, petrolatum, one part, is slowly disintegrated in water, but finally wholly gives up its silver nitrate.

ON DIACHYLON OINTMENT.*

BY J. M. GOOD.

QUERY NO. 39.—"*Can the present U. S. P. process for the preparation of diachylon ointment be improved upon? If so, suggest a better.*"

Diachylon ointment is extensively used by dermatologists in the treatment of eczema, and the results obtained justify this.

When made by the original formula of Hebra, the product is uncertain and consequently unsatisfactory, unless undertaken by skilled manipulators ; and even when well and carefully made, it is unfit for use in a few days. An unstable product, made by an impracticable process, has little to commend it, it seems to me, and no one will care to excuse or explain its unpopularity.

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* Read at the Fourth Session.

The procsss consists in boiling together—

Olive oil, pure	f. ℥ xv.
Powdered litharge	ʒ xxx.
Water	q. s.

Steam heat is employed, and the finely powdered litharge is to be sifted into the boiling mixture of oil and water. In due course of time a lead soap (diachylon) is formed, and the excess of oil employed is incorporated with this by stirring till cool.

It is plain that the difficulty about this process for the retailer lies in the fact that the successful manufacture of lead plaster is an art which, in the natural order of his education, he is not apt to acquire. This process gives a nearly white product. A sample pound of Hebra's diachylon ointment, perfectly white, was recently sent me by a manufacturer.

It was evidently made with the freshly "precipitated hydro-oxide of lead," and although it was advertised as a superior article, it was rancid and unfit for use.

The process of the Pharmacopœia, which consists in melting together

Lead plaster	60 parts,
Olive oil	39 parts,

and flavoring with

Oil of lavender	1 part,

is theoretically a good substitute for the original. The color, though darker, is not objectionable; but Dr. Van Harlingen calls it "tough and stringy," and dermatologists generally condemn it.

Professor Remington, in a carefully prepared paper presented to this Association two years ago, spoke strongly in favor of substituting, for the 39 parts of olive oil, an equal quantity (39 parts) of petrolatum.

As I have made this ointment for a number of years by a similar process, and to the satisfaction of a particularly careful specialist, I feel it my duty, since the query is proposed, to again call your attention to it.

I have not tried the proportions recommended by Prof. Remington, but it seems to me the ointment would be rather firm, particularly for winter. I have always used *equal parts* of *lead plaster* and *petrolatum*, using oil of lavender or oil of rose geranium to perfume slightly.

Unless something better should be presented in the meantime, I would recommend, for the next edition of the Pharmacopœia, the following:

Take of	Lead plaster	50 parts,
	Petrolatum	49 parts,
	Oil of lavender	1 part.

Melt the lead plaster and the petrolatum by heating gently together; stir the mixture while cooling, and when partly cool add the oil of lavender.

Care should be taken to continue the heat long enough to entirely melt the lead plaster.

I would advise the use of petrolatum of 104° melting point for winter use, and that of 120° for summer. A sample of the ointment is herewith presented; also a sample of the officinal.

There is very little difference in the *appearance* of the two articles.

DIACHYLON OINTMENT.*

BY EDGAR L. PATCH.

QUERY 39.—*Can the present U. S. P. process for the preparation of diachylon ointment be improved upon? If so, suggest a better.*

In our judgment, the faults of the present formula are the insufficient quantity of olive oil used, and the employment of oil of lavender.

The ointment is liable to be crumbly, or too firm to apply to the irritated surfaces upon which it is frequently used. The addition of the oil of lavender favors change.

But the greatest difficulty with the ointment arises from the use of plaster and olive oil failing to answer the requirements of the Pharmacopœia.

The lead plaster of the Pharmacopœia is described as "*white*, pliable, and tenacious, free from stickiness, and entirely soluble in warm oil of turpentine."

Very little such plaster is furnished the pharmacist by the wholesaler, and very few retailers make their own.

The plaster is oftener *brown*, brittle, and insoluble. Or it may be brown, sticky, and insoluble.

If white, its whiteness may be due to carbonate of lead, not necessarily introduced as carbonate, but often as an acetate.

Cotton-seed, and other oils, are sometimes substituted for olive oil in making the plaster, producing an ointment far different from that officinally described.

Working by the same formula and with the same material, different manipulators may obtain varying products. Common causes of failure are the employment of too small a quantity of water, and too high a temperature.

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* Read at the Fourth Session.

The flame should not be allowed to play directly upon the bottom or sides of the containing vessel, exposing a portion of the mixture to overheating.

The manufacturer, having at his disposal high pressure steam and a mechanical stirrer, is free from care in this direction, and secures a more uniform product at less cost than the retailer, who works a small quantity by direct heat, and is obliged to give the process constant attention.

Adjusting the vessel to its source of heat, so that a temperature of about the boiling point of water is sustained, and constantly stirring to favor the passage of the bubbles of watery vapor through the mass, and maintaining the litharge in contact with the oil, the process is completed in from six to eight hours. I have not seen a "*white, perfectly soluble plaster*" produced by this method, but a very light colored, nearly soluble plaster may be made.

Some manufacturers heat the litharge to decompose the carbonate it commonly contains, and thus secure more perfect combination; but if the heat employed is too little, red lead is produced, and interferes with the production of a light-colored plaster. A dull heat is necessary to prevent this change.

Very many add to the mixture of oil, litharge and water, after boiling for two or three hours, sugar of lead dissolved in hot water, in the proportion of one part of sugar of lead to forty of the combined litharge and oil.

This lightens the color of the product materially, and we would suppose a quantity of subacetate of lead might result at the expense of any uncombined oxide, and this subacetate or oxyacetate be decomposed by continued heating with the oil, the acetic acid being replaced by the fatty acids, and expelled by the heat. If added too near the close of boiling, a portion of undecomposed oxyacetate may remain in the plaster, and become carbonated in part, on exposure.

Some profess to produce a *white* plaster from cotton-seed oil, or a mixture of cotton-seed and lard oil and litharge, without the use of acetate of lead; but we have been unable to do so.

A very good ointment can be made by Hebra's formula, "Litharge, 20 parts; olive oil, 80 parts; oil of lavender, 1 part; water, q. s."

Mix the litharge, oil and twenty parts of water, boil until combination is secured, adding water as required, strain the hot mixture through flannel, cool and separate the excess of water, heat on a water-bath with constant stirring until *all* the water is expelled, remove from heat, stir until nearly cold, and add the oil of lavender (perfectly fresh). To assure closer compliance with the Pharmacopœial formula, I would suggest a modification of Deringer's method, published in Amer. Jour. Phar., 1880, p. 473.

Dissolve five parts of white Castile soap in thirty parts of boiling water, neutralize free alkali by adding with rapid stirring (using a strong, clean, wooden paddle) acetic acid until fatty acids begin to separate, strain, add slowly with constant and thorough stirring a hot solution of acetate of lead (1 to 4, filtered) until the lead is in slight excess, decant the mother water, and wash the ppt. free from acetate by kneading under hot water by means of the wooden paddle. If an excess of soap is left, it is hard to wash out, and interferes with the keeping qualities of the plaster.

The entire decomposition of the soap by the lead acetate is indicated by the mixture coming to froth when actively stirred.

After washing, remove the plaster to an inclined marble slab, and by kneading and rolling work out all the water possible. *Carefully* remelt the plaster, at a very low heat, add two parts of glycerin for every five parts of plaster, mix well together, remove to the slab and again work out excess of liquid, and while warm mould into suitable shape.

The object of adding the glycerin is to replace, as far as possible, the water mechanically retained after the first working, producing a plaster that remains sweet and soft much longer. Plaster so made, carefully worked, is *always* "WHITE AND PERFECTLY SOLUBLE," and never very hard.

For diachylon ointment, very carefully melt sixty-four parts of plaster, very slowly add, with constant stirring, seventy-two parts of best olive oil, remove from source of heat, stir actively until nearly cold, add one part of concentrated tincture of benzoin (℥vj to Oj, Doliber), and continue stirring until thoroughly cold. To make a smooth, white ointment, requires care and labor. If any water has been left in the plaster, the melted ointment should be kept upon a water-bath until the water is expelled, as it favors rancidity.

All lead ointments, I am familiar with, are subject to change, but such an ointment as suggested keeps quite well, and has been subjected to the ordeal of shipment to the Pacific coast in midsummer without serious impairment. Accompanying this paper are samples for inspection.

OLEATE OF MERCURY.*

BY EMLEN PAINTER, PH. G.

Is pure oleic acid for the preparation of oleates equal to an acid which contains a portion of stearic acid?

The above query suggested to me the offering of a few notes on the preparation of oleate of mercury. This valuable therapeutical agent, which is so prone to decomposition when made by the usual method (and that of the Pharmacopœia) of heating together at a moderate temperature oleic acid and mercuric oxide, has been the subject of a number of experiments made in the endeavor to obtain a more stable article. I have used the various acids obtainable in trade channels, and I find little or no difference between the purest and the poorest acids, as regards the keeping qualities of the oleate. I have, however, been unable to either make or obtain an acid to correspond exactly with "oleic acid" of the Pharmacopœia (aside from its sp. gr., which is evidently a mistake). Yet, by first making "lead plaster" from olive oil, litharge and water, dissolving out the oleate with petroleum benzin, decomposing this with muriatic acid, washing well with water, and evaporating the separated benzin solution, I had an acid which I think was as near that of the Pharmacopœia as may be obtained. It had a much higher sp. gr., and a slight odor and taste, otherwise it would stand the tests except as to the freezing point, which I did not take. In oleate of mercury made with this acid, I could see but little if any difference from that made with purified red oil; if there was any difference it was in favor of the red-oil preparation. The red oil employed was carefully selected, and nearly all the stearic acid and other fatty acids were separated by Dr. Rice's method (Am. J. Ph., Jan., 1878).

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* Read at the Fourth Session.

I had employed, in my experiments up to this time, yellow oxide of mercury. I then substituted very finely triturated red oxide, and found it dissolved more readily than the other, and made a more satisfactory product; also, the more prolonged the heat (even at the very moderate temperature of 120° F.) the sooner the oleate evinced a change, by assuming a bluish hue on the surface, from reduction of the mercury. My experiments further demonstrated very clearly to my mind that no heat whatever should be employed in making this preparation. The oxide and acid combine readily without it, even to saturation of the acid, and in the winter season it is but a question of a few days, whilst at this season of the year one day will suffice to make the finished oleate.

When the preparation has been so made, I have kept it in wide-mouthed bottles filled and corked tightly of the strength of 20 and 25 per cent. of the oxide, for nearly two years without any apparent change, whilst that made with the yellow oxide, and heating slightly, I have never been able to keep more than three or four months without its showing some change.

My mode of manipulation is this—to first thoroughly triturate in a liberal-sized mortar any convenient quantity of red precipitate until it is reduced to a uniformly very fine powder; then mix the required amount of oleic acid (so as to have 20 or 25 per cent. of the oxide) in such a way that there will be no lumps, and a perfectly smooth and uniform mixture will be the result—this is the only difficult part of the operation, which I will further allude to hereafter—then set the mixture aside for a few hours, when again mix thoroughly, and if the mixture has lost, or nearly so, the red color, put it in suitable vessels, which should be completely filled and tightly covered, so as to exclude the air. If, however, the mixture has still a deep color, showing that the red oxide is yet uncombined, again set aside; this operation is to be repeated as often as may be required—two or three times at the furthest will suffice. After standing a day it will be found to have entirely lost its red or pinkish cast, and to have assumed the yellow color of the oleate. The water formed by the reaction is of course admixed, probably forming a hydrate, as there is no appearance of free water being present. The following equation shows the reaction:

$$HgO + 2C_{18}H_{34}O_2 = Hg[C_{18}H_{34}O_2]_2,H_2O.$$

The officinal oleate is in my experience not the most desirable one; one containing the result of 20 per cent. of the oxide is far more frequently prescribed, and is of a consistence to render it more stable. When decomposition commences in the higher percentage preparations, it will be found at first confined to the surface and can easily be removed, the underlying oleate being perfectly good and fit for use; whilst with the officinal liquid preparation, when the decomposition commences, the reduced mercury makes its way to the bottom of the vessel, and the constant motion of the liquid hastens the change. The whole preparation is at once really unfit for use, the percentage of oleate constantly diminishing, and the irritating oxy-oleic acid constantly increasing.

Now, to come to the query, as relates to the mercurial compound "Is pure oleic acid equal to acid containing a portion of stearic acid?" For making an oleate of the officinal strength, I would say that it is not, and that the quantity of stearic acid present should be sufficient to make the finished product the consistence of a soft solid. But for making a 20 or 25 per cent. solution I can see no disadvantage in employing as pure an acid as may be obtained; at the same time I consider purified red oil, before mentioned, and as prepared by Dr. Squibb and other manufacturers, all that is to be desired in making this oleate. I find it to be more satisfactory in practice than an acid from lard oil made by Dr. Squibb, although the latter is presumably purer from the fact that it is sold at just three times the price. It doubtless contains less of the oxy-oleic acid, the samples examined having a less marked effect upon test paper; it, however, seems to have as much odor, and as deep a color, and I am inclined to the belief that it contains more or less non-decomposed oil, as it does not act so promptly on a given quantity of mercuric oxide. I have not had the opportunity to test its saturating power, however, or the stability of the product, as compared with the other acid.*

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* Since writing the above, I find that the lard oleate does not keep so well as the red oil oleate, both made in precisely the same way, at the same time, and with the same oxide of mercury.

In regard to the manipulation above referred to in preparing this oleate, it doubtless has been the experience of all who have made it in the cold, that upon mixing the acid with the heavy mercuric oxide, the latter conglomerates into tough masses, forming hard cakes sticking to the bottom of the mortar and to the pestle, which are only with the greatest difficulty uniformly distributed through the mass. This trouble will occur to a greater or less degree no matter how much pains are taken in adding the acid, nor how diligently the powder is stirred and triturated whilst it is being added. I have found it a good plan to add the oxide and acid in divided portions, or better to mix the oxide with about 20 per cent. of a finished oleate first, which can readily be done, then to gradually add the acid, stirring it thoroughly during the addition, and taking pains to add the acid fast enough not to let the mixture get so stiff by the reaction that fresh portions of acid cannot be readily and uniformly mixed. If the acid and oxide only are used, it is best to remove about three quarters of the oxide from the mortar in which it was powdered, distribute the balance over the bottom of the mortar, then add slowly about three or four times as much acid, triturating rapidly during the addition; make this mixture perfectly homogeneous before further additions, then add oxide and acid from time to time, and in such proportions as to maintain a semi-fluid consistence, avoiding lumps, and finally add the balance of the acid. Another plan I would suggest which I found to work admirably in practice, is to first mix the oxide with some neutral substance as a diluent for the oleate formed, instead of the excess of oleic acid. A variety of substances may be used for this diluent. I have employed ointment of petroleum, oil, and plasma. In the use of either of these, for instance petroleum ointment, in making a 20 per cent. solution, first mix the finely powdered oxide with an equal weight of the petroleum ointment in a mortar; this is very readily done, and a perfectly smooth mixture is formed, then gradually add the acid, triturating rapidly during the addition to maintain a uniform mixture of the whole, and add the acid fast enough not to let the mixture get too stiff for the fresh portions to be readily stirred in. This plan entails very little labor, and makes a beautiful preparation, the petroleum ointment not seeming to retard the chemical reaction in any considerable degree, and the result is all that may be desired as a pharmaceutical preparation. I am unable to state positively, however, as to whether it is so good a therapeutical agent.

It has been repeatedly asserted that petroleum ointment (vaseline) should not be used as an excipient where the drug incorporated is intended to be absorbed; and from the experiments of Dr. Kiernan (Drug. Cir., April 1884) it would appear that absorption is prevented completely by the presence of vaseline, whilst with a lard excipient he had a decided effect. On the other hand, the experiments of Mr. E. Joerss (Am. Druggist, Aug. 1885) would go to prove that petroleum ointment is the better excipient of the two. My experience has been, in dispensing the oleate of mercury, that quite as satisfactory results have been obtained from that diluted with vaseline as with oleic acid, and I have been informed by the patients using it that it was equally prompt in its action.

I am inclined to believe that vaseline is a proper diluent for oleate of mercury where it is required of a less percentage of the base than the combining proportions, even if the oleate is absorbed less freely when much diluted, as the higher percentages are used when a constitutional effect is desired, and the lower percentages when used merely for the local effect. Besides, the different percentages then would be of about the same consistence, which is quite an advantage in the preservation and dispensing of this preparation.

Plasma, as an excipient, I have not used until recently, when I prepared an oleate containing a slight excess of oleic acid, which was ultimately reduced with plasma to 5 per cent. This makes a good preparation, and in five weeks' time shows no perceptible change, although the sample has been exposed in a wooden box and has been examined many times. Oleate of mercury, I have also prepared by double decomposition, using oleate of potassium and nitrate of mercury after the manner described by Mr. Parsons (Drug. Circ., Jan. 1885), but I do not find this method near so satisfactory as the direct union of the acid and base as described above.

In regard to the absurd notion, that true oleates are made only by double decomposition, it would hardly be worth the time to argue, if it were not that this oft-repeated assertion had thereby gained some credence, or at least raised doubts on the subject, although it has already been refuted by Dr. Squibb in his "Ephemeris," as well as by others.

The fact of a mixture of the oxide and acid forming a hard cake almost immediately shows there is a chemical reaction. The cake is formed by the acid displacing the air in the interstices of the dense, fine powder, thus forming the pasty oleate with a portion of it, which acts as a cement, making the whole into a compact mass. If it were merely a solution of the oxide, this would not be the case.

Then again, separate the particles of the oxide by an equal weight of oil, then add quickly and stir thoroughly together four times the weight of oleic acid, and the resulting mixture can readily be poured from one vessel to another. This begins gradually to thicken, and in a very few minutes the retaining vessel may be inverted without displacing its contents. The reaction still continues until the whole assumes the color and other characters of oleate of mercury.

A still better proof, however, of chemical change and not mere solution, is in the increase in temperature; the foregoing mixture will immediately show a rise in temperature, and in five minutes' time will mark more than as many degrees upward (Fahrenheit scale); the evolution of heat being a phenomenon attending chemical change, whilst the reverse —the absorption of heat—is a result of mere solution.

RECAPITULATION.

As a summing up of the results of my work, I may add that in my opinion—

1. Pure oleic acid for the preparation of a 20 per cent. oleate of mercury is equal to an acid containing a small percentage of stearic acid, though not superior to it; but for the preparation of an oleate of the officinal strength, it might preferably contain sufficient stearic acid to make it of the consistence of a soft solid.

2. Purified red oil, made from good, fresh fat, is in every way suitable for making this oleate.

3. Very finely triturated red oxide of mercury is preferable to the yellow oxide, and no artificial heat whatever should be employed in making this preparation.

4. Oleate of mercury is best prepared by the direct union of the oxide and acid.

5. Petroleum ointment is a proper diluent for the oleate containing a less percentage of mercury than the combining proportions, and to facilitate its preparation about an equal weight of the petroleum ointment should be mixed with the oxide before the acid is added.

6. Glycerite of starch (plasma) will probably be found a suitable excipient for diluting this oleate.

7. The idea that true oleates are formed only by double decomposition is absurd; just as much of a chemical compound is formed, as by mixing a mineral acid with the base, or as is formed by making an oleate from oil and a base, the latter being the source of the oleic acid, when the oleate is made by double decomposition.

New York, August 29, 1885.

AN EXAMINATION OF THE MENTHOL CONES OF THE MARKET.*

BY P. W. BEDFORD.

Since the date of the acceptance of the above query, the subject of menthol cones has received the attention of several writers, and the publication of their results has been noticed in some of the periodicals.

The wonderful commercial success that attended the result of the introduction of this novel remedial agent produced the usual crop of imitators, and so the product has by some of these imitators been made to suit the reduced price at which they offered their commodity.

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* Presented at the Fourth Session.

Crystals from Japanese peppermint oil, and an imported oil from China, have long been used in their respective countries as domestic cures for headache. Of late years Japanese oil of peppermint has come slowly into use in limited quantities in this country and on the Continent, but the production of menthol is still more recent.

The source of the menthol is a plant to which the name *Mentha arvensis* has been given, but which plant, recently seen in flower, seems rather to belong to the pennyroyal family of our land.

The menthol cones in the market are mainly prepared from the Japanese menthol; a few from the American menthol, known by the name of pip-menthol. Save that the latter has a more distinctive odor of peppermint as we know it from our domestic oil, there is apparently so trifling a difference in form of crystal, in chemical composition, fusing point, or other physical or chemical characteristics, that they may be considered almost, if not perfectly identical.

The examination of menthol cones has been reported upon in the *Therapeutic Gazette* by Dr. A. B. Lyons, in the proceedings of the California Pharmaceutical Society by F. Grazier, and by one or more investigators in other journals, while the tests for its adulteration by various materials have appeared in chemical and pharmaceutical journals. The only adulterants found by the writer were those of paraffin and salicin. In one sample the label stated that it was half strength, while others either claimed entire purity or said nothing on the subject.

On the menthol cones examined we may enumerate "Mentholine" and and "Mentholette," made by Dundas Dick & Co.; menthol cones, made by Parke, Davis & Co., John Wyeth & Brother, Valentine, Bradford, Requa & Wetmore, F. Stearns & Co., and the Chinese headache cure.

"Mentholine," "Mentholette," and the cones made by Parke, Davis & Co., and "Pain Cones," made by F. Stearns & Co., are pure menthol; those made by John Wyeth & Brother had a mere trace of wax, which evidently was used to harden the menthol; while the others enumerated contain large proportions of paraffin, varying from two- to four-fifths, and in one sample the adulteration was salicin, of which impurity nearly four-fifths was present. No one who even glances at the cones need be deceived, as the appearance of the paraffin may be detected by the eye as well as the touch. The admixture of salicin gives the cone a more opaque appearance, but the application of a very limited amount of heat reveals at once the fraud by the infusibility and the white powder. Pure menthol is dissipated at a temperature of 100° F., while paraffin does not melt at any such temperature; pure menthol leaves no stain on paper when dissipated. There appears to be considerable difference in the transparency and firmness of Japanese menthol, due probably to the amount of oil retained, this giving more color and less hardness to the cone.

II. CHEMISTRY.

STICK CAUSTIC POTASH OF COMMERCE.*

BY EDWARD GOEBEL.

QUERY NO. 25.—*What is the per cent. of caustic alkali (KHO) in the stick caustic potash of commerce?*

Original packages of potassa, made by four of our leading manufacturers, were procured from jobbing houses at various times, during a period of eight months. The physical appearance of the samples differed widely, some being perfectly white and opaque, others more translucent, and one possessed a very decided yellow color. All were perfectly soluble in water, however. These samples were examined as follows:

1. All *weighings* were made by quickly wrapping a piece of the caustic approximating to the quantity wanted, in a piece of tinfoil, weighing the whole, reweighing the foil, and deducting this from the total. Particular care was exercised throughout to prevent absorption of water, and consequent inaccurate results.

2. The *total amount of alkali*, hydrated and carbonated, was volumetrically determined with normal oxalic acid, recently prepared from doubly re-crystallized acid. From three to five grams of potassa were weighed and transferred to a flask, dissolved in water, litmus solution added to color decidedly blue, and the whole brought to 200 cc. by addition of sufficient water. 50 cc. of these solutions were taken for each titration, two and three titrations being made of each sample, and the average taken as the final result. To determine the neutralization point, Mohr's directions were followed (Titrirmethode, p. 76), i. e., boiling partly saturated alkali solution to expel all liberated carbonic acid, and continuing to add normal acid till the liquid, after continued boiling, retains a light-yellowish-red (zwiebelroth) color, when viewed against a white background, indicative of a *slight excess* of acid.

3. *Carbonate*, having been found in considerable quantity in all samples, was estimated by means of *hot* lime-water. The addition of the heated lime-water to the potassa, previously dissolved in a little water, causes a crystalline precipitate of carbonate of lime, which can be readily washed, dried and calculated for carbonate of potassium.

4. The *chloride* was also gravimetrically determined, an excess of nitrate of silver being added to a solution of caustic previously acidified with nitric acid.

5. *Sulphate* was present in very small quantities only, not sufficient to warrant a quantitative assay.

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* Presented at the Fourth Session.

6. A portion of each sample acidified with hydrochloric acid, evaporated, calcined and weighed, yielded a trifle *less* chloride than indicated by the alkalimetric examination, thus precluding the presence of notable quantities of other fixed impurities, and indicating probably a small percentage of soda, this latter base being also indicated by the flame test· The chloride when dissolved in water separated a few flocculi of *silicic acid*.

I think it admissible to calculate the difference in the weight of the caustic, and that of the sum of the hydrate, carbonate, and chloride of potassium found, as *water*, which will show the comparative value and degree of purity of the different samples with sufficient accuracy for practical purposes. The following table shows results obtained by above-stated experiments:

Sample.	Total alkali, free and carbonated, calculated as KHO.	Carbonate potassa, K_2CO_3.	Hydrate potassa, KHO.	Chloride potassium, KCl.	Water.
A.	77.251	7.850	70.880	1.009	20.261
B, 1	79.538	6.384	74.357	0.971	18.288
B, 2	78.260	7.393	72.260	0.929	19.418
C, 1	79.540	9.611	71.740	1.011	17.638
C, 2	76.770	11.692	67.281	0.167	20.860
D, 1	76.340	11.545	66.970	0.998	20.487
D, 2	76.190	15.843	63.332	0.801	20.024
D, 3	75.480	6.677	70.061	1.099	22.163

A glance at this table shows what is probably a generally admitted fact, namely, that the commercial stick caustic falls far short of the officinal requirement of 90% alkali, in place of which we find only 75–79%, including the carbonate. The water percentage varies from 17 to 22; the National Dispensatory states that commercial potassa usually contains an excess of 6–8% of water, whilst the U. S. Disp. gives the amount at 15–28%, a wider range of diversity than found to exist in the samples examined. In order to ascertain if any of this excess of water might be gotten rid of in preparing a *moulded* caustic, a small quantity was made according to U. S. P. directions for liquor potassa, evaporating the solution to such density as would admit of its being poured into the mould. Two separate lots were made, and these assayed respectively 71% and 75% of alkali, including a large percentage of carbonate. These results seem to indicate that the amount of water in commercial caustic can be but little if at all reduced, if the product is to be cast in moulds. Our Pharmacopœia gives no *definite* limit of carbonate allowed, but the quantity found, 6–15%, seems unduly large.

Would it not be a desirable change in the Pharmacopœia to require a minimum alkali percentage of 75 in place of recognizing a 90% product› which is unattainable in the very convenient "stick caustic" form of potassa? An article of that strength would yield a five per cent. liquor potassa by using 67 parts to 1000 parts, instead of 56, as directed at present. And would it not be well to give a *quantitative* test for *carbonate*, allowing for instance a maximum of 5 % of this impurity?

STICK CAUSTIC POTASH OF COMMERCE.*

BY EDGAR L. PATCH.

QUERY No. 25.—*What is the per cent. of caustic alkali* (KOH) *in the stick caustic potash of commerce?*

Caustic potash was obtained, made by six different makers, who probably supply three-fourths of all used by American pharmacists.

Five of the samples were original packages, never before opened.

The samples were tested for the common impurities, chlorides, sulphates, silica, metals and carbonate.

The total amount of alkali was determined by the use of volumetric solution of hydrochloric acid, with methyl orange as an indicator.

The carbonate was estimated by gravimetric determination of carbonic anhydride, and calculation of its equivalent of anhydrous carbonate of potassium. The following table gives a summary of results:

Maker.	Chloride.	Sulphate.	Silica.	Metals.	Total alkali.	Carbonate.	Caustic alkali KOH.
American	Excess	No	Trace	Trace of iron	57 %	4.2 %	52.8 %
“	“	No	“	“	68.8 “	5 “	63.8 “
German (labeled: pure from alcohol)	Trace	Trace	Trace	Trace of iron	70 “	8.57 “	61.43 “
American	Large excess	No	No	“	86 “	5 “	81 “
“	“ “	“	“	“	77 “	2.55 “	74.45 “
“	“ “	Trace	“	“	73.4 “	6.73 “	66.67 “
“	“ “	“	Trace	“	73.8 “	6.61 “	67.19 “

The samples were all below the standard of the Pharmacopœia, as that places the limit of all impurities, water, etc., at 10 %, and demands 90 % of caustic alkali (KOH.).

It may not be out of place to say here that the caustic soda in sticks will not average much better. The four leading makes stand as follows:

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* Presented at the Fourth Session.

Maker.	Chlorides.	Sulphates.	Silica.	Metals.	Total Alkali.
1. German (pure, from alcohol).	Excess.	Excess.	. . . .	Trace of iron.	72.4 %
2. American. . .	"	Large excess.	. . . .	"	67.55 %
3. " . .	Slight excess.	"	Trace.	"	70 %
4. " . .	"	"	"	"	66 %

Numbers one and three contained excess of carbonate, but the actual amount was not estimated, for after standing, all samples absorb carbonic anhydride.

LIQUOR FERRI NITRATIS.*

BY LOUIS DOHME.

QUERY 44.—*Is the formula of our Pharmacopœia for making solution of nitrate of iron satisfactory? Will the preparation keep?*

When liquor ferri nitratis is made strictly according to the present officinal formula, a clear, amber colored, slightly acid solution is obtained, which will keep an indefinite length of time. I have made the preparation frequently by this formula, and have never experienced any difficulty in obtaining a permanently transparent solution, which, when tested in the officinal manner, yielded 2 per cent. of ignited ferric oxide.

To obtain this result it is of course necessary that the solution of tersulphate of iron and the nitric acid should both be exactly of the officinal specific gravity.

In the present formula, the freshly precipitated and washed ferric hydrate obtained from 18 parts of the officinal solution of tersulphate of iron are dissolved in 7 parts of the officinal nitric acid, and the solution diluted with water, to make one hundred parts of the finished preparation.

According to the officinal standard 10 parts of the solution of tersulphate of iron when completely precipitated by excess of water of ammonia yield a precipitate which when washed, dried and ignited, should weigh 1.147 parts, and 18 parts of the solution should therefore yield 2.0646 parts of ferric oxide. If no ferric hydrate were lost during precipitation and washing, these 2.0646 parts of ferric oxide would require 7.03 parts of the officinal nitric acid to form ferric nitrate $Fe_2(NO_3)_6$.

Some of the ferric hydrate is lost, however, during the process of washing and draining on a strainer, so that in practice only about 2 parts of ferric oxide are obtained for solution.

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*Presented at the Fourth Session.

These require 4.730 parts of absolute nitric acid equal to 6.81 parts of the officinal (69.4 per cent.) nitric acid for solution, thus leaving only a slight excess of nitric acid.

By the officinal formula of 1870, a solution of ferrous nitrate was first made by exposing an excess of iron wire to the solvent action of a definite quantity of diluted nitric acid added in small portions, care being taken to moderate the reaction by cooling, so as to prevent the occurrence of red fumes as much as possible. This ferrous nitrate was then converted into ferric nitrate by the addition of a definite second portion of nitric acid, and heating till the reaction was over and all nitrous fumes had been expelled. The solution was then finally diluted to a certain measure with water, producing an amber-colored transparent solution, of which according to the officinal text one fluid ounce on addition of an excess of water of ammonia yielded a precipitate which, when washed and dried and ignited, weighed between 8 and 10 grains, equal to 1.65 to 2.06 per cent. of ferric oxide.

As it is difficult to prevent the evolution of red fumes altogether, and as according to the extent of their occurrence and oxidation of the iron in the *first part* of the process, the quantity of iron in the finished preparation will necessarily vary (as is also indicated in the officinal test as given above) the present officinal formula would seem preferable, as by it with ordinary care a uniform preparation can be made.

COMMERCIAL CALOMEL.*

BY EDGAR L. PATCH.

QUERY NO. 28.—*Is Calomel made in England superior in any way to that of our manufacturers?*

A quite extensive canvass of the retail and wholesale trade of Boston, revealed the fact that two, or at most three American makers, were practically supplying the entire market.

English calomel of but one make was found in stock, and that in but few instances, where it was held to be dispensed in special cases.

The examination of samples of these four makes would discover the condition of the calomel being used, but to properly answer the query enough time should be had to enable one to secure two or more samples of all the manufacturers, English and American.

The following is the result of the examination of these four samples:

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* Presented at the Fourth Session.

No. 1. American, white color, sp. gr.	7.82
No. 2. American, white color, sp. gr.	6.94
No. 3. American, white color, sp. gr.	7.53
No. 4. English, light cream, sp. gr.	7.93

Specific gravity was taken with water at 4° C., or 39° F. as the standard of comparison.

Five grams of each sample, shaken with fifty grams of distilled water, the filtrate in each case gave a ppt. with nitrate of silver and sulphuretted hydrogen.

One gram of each sample placed upon a polished steel surface and moistened with a little alcohol, allowed to stand five minutes and removed, corroded the steel in each case, showing the presence of mercuric chloride.

Heated with solution of potassa no odor of ammonia was evolved, showing absence of ammoniated mercury.

An original package containing one pound was washed free from chloride and the washings carefully concentrated for quantitative examination, but the intervention of an unknown factor removed the solution beyond the reach of mortals, and lack of time prevented a repetition of the work. From our examination we conclude that the calomels of our market do not strictly meet the requirements of the Pharmacopœia, but all contain mercuric chloride in small amount. Placing our samples in order related to their indication of mercuric chloride, we have one, four, three, two. One, greatest indication; two, the least. Yet different lots by the same maker are liable to vary, so that the pharmacist should test all dispensed for internal use, and if need be wash it himself.

CALOMEL.*

BY P. W. BEDFORD.

In the list of queries published in the last Proceedings of this Association, there are two relative to calomel, one as to the asserted superiority of the English calomel, the other as to the purity of the calomel of the market.

The writer finds on inquiry that but two brands of English calomel are known to be imported, and of but one of these was he able to procure a sample; of German origin, a sample of but one manufacture was found, and this in both crystalline and powdered form, the latter being labeled as prepared by precipitation and as *pure*. Of American manufacture, two manfactures are known, and of these makes samples were procured.

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* Presented at the Fourth Session.

Chemically examined with care, no trace of impurity or adulteration existed in any one of the samples. Taking advantage of the superior solvent power of ether for corrosive chloride of mercury over water or alcohol, portions of each of the samples were repeatedly shaken with it, and the ethereal liquid poured upon a watch-glass failed to leave any residue, nor were any reactions shown in a cold watery solution with either nitrate of silver or sulphuretted hydrogen (one sample I examined two or three years ago contained chloride of sodium in minute proportion.)

The samples were examined for me microscopically by Dr. R. G. Eccles, who reports that they differ but little in their appearance, though he was of the impression that one of the samples was produced by trituration of the crystalline mass, and the other three by precipitation either by means of steam, water, or cold air. The sample that had the appearance of a triturated powder was that of English manufacture.

As to the preference for English calomel, the writer sees or knows of no good reason why it should exist. One pharmacist preferred it for making "Lotio nigra," because he thought it gave a better result; but on trying the experiment with each of the samples, no difference whatever could be detected in the finished preparation. The only other reason assigned for using English calomel was that of having always used it, and not caring to make any change.

In view, however, of the fact of the processes by which mercurous and mercuric chloride are prepared being so similar, he would advise that every sample of calomel be tested before going into the stock bottle. About 100 hundred grains placed in a test tube, and shaken with two portions of stronger ether, each of two fluid drams, the powder allowed to subside, the ethereal liquid poured on a clean watch-glass and allowed to evaporate spontaneously, will contain all the mercuric chloride, if any be present. It may then be tested further if there be any residue on the watch-glass.

NOTE.—The writer has since his return from Pittsburgh repeated his tests and applied additional tests to the samples in his possession, confirming the results of this paper. This because in a paper by E. L. Patch, at the same meeting, the results obtained by him and his conclusions differ from those stated above. While these papers show differing results, it by no means follows that either experimenter was in fault, but that samples from different lots of manufacture may and possibly do vary. The writer learns that it is usual for the manufacturers to test samples of each lot produced, so that none will be sent out that contain any appreciable traces of corrosive chloride.

BLACK ANTIMONY OF COMMERCE.*

BY ROBERT B. WARDER, PROFESSOR OF CHEMISTRY IN THE SCHOOL OF PHARMACY AT LAFAYETTE, IND.

QUERY No. 84.—*What is black antimony of commerce?*

The term "black antimony" is sometimes applied to the powdered metal, as in Roscoe & Schorlemmer's Treatise on Chemistry, Vol. II., part ii., p. 306; but in pharmacy it is supposed to mean the powdered stibnite or native sulphide.

Fifteen samples were procured from as many retail druggists in eastern cities and the central states; and it soon became evident that the name is used in very different senses in the two sections of the country. The "pure antimony black" of the price lists is the genuine stibnite in a powdered form—there is no evidence that it has been purified; "commercial antimony black," on the other hand, is an utterly spurious imitation of the same, yielding no trace of antimony by the tests of the Pharmacopœia.

The following table shows the localities where the several samples were procured, and the reaction of the two kinds:

1. Cincinnati, Ohio.	HCl dissolved a portion of each sample (usually with violent effervescence in the cold), leaving considerable black residue. There was no evolution of H_2S, and no traces of antimony could be detected in the solutions by means of water or H_2S. Specific gravity of the powder, including air spaces, about 1.25.
2. "	
3. Chicago, Ill.	
4. "	
5. Ypsilanti, Mich.	
6. Indianapolis, Ind.	
7. Lafayette, Ind.	
8. Vincennes, Ind.	
9. "	
10. Boston, Mass.	HCl dissolved each sample (except a small residue), with moderate effervescence of H_2S. Each solution gave a heavy white precipitate by dilution with water, soluble in tartaric acid. H_2S re-precipitated orange Sb_2S_3.
11. "	
12. New York, N. Y.	
13. Philadelphia, Pa.	
14. "	
15. "	

The appearance of these two substances is different enough when seen side by side, especially when observed with a lens. Powdered stibnite (Nos. 10 to 15) is inclined toward a bluish red color, with almost metallic lustre, suggestive of ground galena. No. 14 was very finely powdered, and appeared less lustrous unless pressed with a knife blade. Nos. 1 to 9 have a duller appearance of iron grey: the contrast with stibnite gives the impression of a reddish tinge. With a pocket lens, however, the larger particles shine with a black resinous lustre like anthracite coal.

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* Presented at the Fourth Session.

No. 1 was unchanged by heating in a closed tube, and effervesced in the cold with HCl, leaving a black residue that burned with difficulty to a whitish ash. The acid solution contained both calcium and magnesium. A partial separation was made by simple elutriation, the black particles being washed off, while a white translucent powder was left. This effervesced with cold dilute HCl, and dissolved almost entirely on boiling. Sample No. 1 seems to have been made by mixing powdered anthracite with marble or magnesium limestone. Detailed analyses were not made of the remaining samples, except as indicated in the foregoing table; but they are all essentially like No. 1. Paper moistened with solution of lead acetate was used in each case, to test for traces of hydrogen sulphide. A bottle holding one ounce of water will hold 2¼ ounces of powdered stibnite (when well shaken together without pressure), but only 1¼ ounces of the imitation. This may afford a convenient mode of distinguishing between them, for those who do not wish to apply the chemical tests. In fact, the difference of specific gravity is so great, that any one accustomed to handle packages of such drugs would instantly suspect the spurious article from its greater bulk. A certain dealer is said to have defended his sales of the coal dust on the ground that genuine black antimony "kill all the stock in the country."

It is not the purpose of this paper to discuss moral questions; but it would be a great convenience to avoid ambiguity by calling coal and limestone by their own names.

TARTAR EMETIC OF COMMERCE.*

BY ROBT. B. WARDEN, PROFESSOR OF CHEMISTRY IN THE SCHOOL OF PHARMACY AT LAFAYETTE, IND.

QUERY No. 68.—*What is the quality of commercial tartar emetic?*

Thirteen samples were procured from as many retail druggists in various cities. The ready solubility in water indicated the absence of notable quantities of acid potassium tartrate; but two specimens left a pulverulent residue, probably of antimonious oxide. Eight specimens contained at least traces of calcium, but only one contained traces of sulphate, while chlorides and iron were wholly absent, and any possible traces of arsenic were too small to be shown by Fleitman's test.

This drug is usually nearly pure, calcium salt being the chief impurity. This could easily be introduced with the acid potassium tartrate used in manufacture, and would seldom lead to injurious results. Details are given in the table below:

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* Presented at the Fourth Session.

No.	Locality.	Action with water.	With Am_2O_4.	With $BaCl_2$ and HCl.	
1	Cincinnati, O . .	Soluble.	Precipitate on standing.	Clear.	No indication in any of the samples of chlorides with $AgNO_3$, of iron, etc., with K_4Fdy, nor of arsenic by Fleitman's test.
2	Chicago, Ill . . .	Soluble.	Clear.	Clear.	
3	“ . . .	White residue.	Precipitate.	Clear.	
4	Ypsilanti, Mich. .	Soluble.	Precipitate.	Clear.	
5	Indianapolis, Ind.	White residue.	Precipitate.	Clear.	
6	Lafayette, Ind . .	Soluble.	Precipitate.	Clear.	
7	Vincennes, Ind. .	Soluble.	Marked precipitate.	Slight precipitate.	
8	Vincennes, Ind. .	Soluble.	Clear.	Clear.	
9	Boston, Mass . .	Soluble.	Slight precipitate.	Clear.	
10	Boston, Mass . .	Soluble.	Clear.	Clear.	
11	New York, N. Y.	Soluble.	Clear.	Clear.	
12	Philadelphia, Pa .	Soluble.	Marked precipitate.	Clear.	
13	Philadelphia, Pa .	Soluble.	Clear.	Clear.	

GLYCERIN OF COMMERCE. *

BY EDWARD GOEBEL.

QUERY NO. 34.—*How does the glycerin of commerce conform to the requirements of the Pharmacopœia?*

Although work was commenced on the above query shortly after its acceptance last year, the experiments made have not been as exhaustive as they should be, only fifteen samples having been examined. These samples represent eight manufacturers, viz.: one English, three German, and four American, and were procured at various times from wholesale druggists in New York and Louisville.

It was aimed, at first, to apply all the pharmacopœial tests as directed, throughout, but it was subsequently found that several of these may well be omitted. The color of each sample was noted, the deportment with test paper, and the specific gravities were ascertained, and the dilute sulphuric acid test was also applied as directed. None but sample *E.* had more than a barely perceptible odor.

“*Gently warmed with an equal volume of concentrated sulphuric acid, in a test-tube, it should not become dark-colored* (*absence of cane sugar*),” is a test which may be dispensed with, it seems; the warning at least is unnecessary, for there is considerable heat developed on mixing the glycerin and sulphuric acid, and a further application of heat results in the discoloration of even a very pure glycerin. The copper tests for both cane and grape sugars also appear superfluous in view of the apparent delicacy of the combustion test (Godeffroy) which the Pharmacopœia likewise recommends. Even a very small percentage of any carbohydrate is very readily recognized by this test, for whilst pure glycerine remains nearly colorless while burning and leaves merely a dark stain, the presence of less than one per cent. of sugar colors the burning liquid very decidedly, and is also indicated by the black carbonaceous residue. None of the glycerins examined showed the presence of sugars, there remaining in each case but a dark stain after combustion, and this stain was in every instance almost entirely dissipated by incineration, and consequently not more than mere traces of fixed mineral impurities were contained in the same.

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* Presented at the Fourth Session.

The nitrate of silver test (which Mr. Bower lays much stress upon), is too indefinitely given in the Pharmacopœia: "*A portion of glycerin diluted with 10 parts of water, should give no precipitate or color with test-solution of nitrate silver.*" Glycerin may be very impure without producing an immediate change in a solution of silver, unless chlorides be present; and on the other hand, if the mixtures are allowed to stand too long, and not carefully protected from light, the silver will be partly reduced, though the glycerin answers to other tests for purity. The test was applied in these experiments by mixing one volume of glycerin with four volumes of one per cent. silver solution in a test-tube, corking, and setting aside in a dark place—average temperature about 80° F.—and the changes produced in ½, 1, 2 and 24 hours respectively, were noted. Two hours would seem to be the maximum length of time that a glycerin of fair quality will remain unchanged if treated in this way.

None of the samples were visibly affected by treatment with either chloride calcium, chloride barium, ammonic sulphide, or oxalate ammonium.

The table on the opposite page shows results obtained.

From this it appears that no *adulterated* glycerin is sold by reputable drug firms, nor does the density of the American brands in any case fall below the officinal standard of 1.250. But nearly all samples examined fall more or less short of the pharmacopœial requirements for purity. Samples A. B. C. and P. were brands which are universally acknowledged to be of the very best quality, if not absolute purity, and the U. S. P. seems a little too severe in requiring *perfect* neutrality, and the absence of *all* odor when treated with dilute sulphuric acid. By far the larger quantity of the glycerin offered in our market, however, contains undue proportions of impurities, and this inferiority is probably to be accounted for solely by the demand for a cheap article. Some manufacturers, at least, furnish two or more grades, and it goes without saying, that the low-priced grades are in greatest demand.

Sample.	Specific gravity.	Color.	Reaction.	Odor developed by warming with dilute sulphuric acid.	Deportment with nitrate silver solution after half (½) hour.	Deportment with nitrate silver after one (1) hour.	Deportment with nitrate silver solution after two (2) hours.	Deportment with nitrate silver solution after twenty-four (24) hours.
A.	1.253	None.	Neutral.	Perceptible.	Not affected.	Not affected.	Not affected.	Pink color and black precipitate.
B.	1.246	None.	Faint acid.	Perceptible.	Not affected.	Not affected.	Not affected.	No color and brown precipitate.
C.	1.253	None.	Plainly acid	Plain.	Yellowish color.	Reddish-yellow color.	Reddish-yellow color.	No color and brown precipitate.
D.*	1.238	None.	Faint acid.	Perceptible.	Not affected.	Not affected.	Not affected.	Not affected.
E.	1.252	Yellowish.	Faint acid.	Plain.	Not affected.	Pink color.	Pink color.	No color and black precipitate.
F.	1.253	Yellowish.	Faint acid.	Perceptible.	Not affected.	Not affected.	Not affected.	No color and black precipitate.
G.	1.253	Yellowish.	Plainly acid	Perceptible.	Yellowish color.	Yellowish-brown color.	Yellowish-brown color and black precipitate.	Red brown color and black precipitate.
H.	1.253	Yellowish.	Neutral.	Perceptible.	Not affected.	Pink color.	Yellowish-brown color.	Reddish color and black precipitate.
I.	1.254	Yellowish.	Plainly acid	Perceptible.	Yellowish color.	Yellowish-brown color.	Yellowish-brown color.	Reddish color and brown precipitate.
K.	1.253	Yellowish.	Plainly acid	Plain.	Pink color.	Pink color.	Pink color.	No color and brown precipitate.
L.	1.254	Yellowish.	Faint acid.	Plain.	Pink color.	Pink color.	Pink color.	No color and brown precipitate.
M.	1.253	Yellowish.	Plainly acid	Plain.	Not affected.	Pink color.	Pink color.	No color and brown precipitate.
N.	1.253	None.	Faint acid.	Perceptible.	Not affected.	Not affected.	Not affected.	Not affected.
O.	1.257	Yellowish.	Faint acid.	Plain.	Not affected.	Not affected.	Not affected.	No color and black precipitate.
P.	1.257	None.	Neutral.	None.	Not affected.	Not affected.	Not affected.	No color and black precipitate.

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* This was a foreign sample, very little sold in this country.

GLYCERIN OF COMMERCE.*

BY EDGAR L. PATCH.

QUERY No. 34.—"*How does the glycerin of commerce conform to the requirements of the Pharmacopœia?*"

Eleven samples, from ten different makers, were obtained and tested. Their sp. gr. was taken with a bottle accurately graduated at 4° C. (39° F.), the glycerin being compared at the officinal temperature of 15° C. (59° F).

The application of the sulphuric acid test may lead to error. If two or three grams are mixed with an equal volume of sulphuric acid, and the mixture warmed by exposure to a Bunsen or alcohol flame, no two samples will be exposed to the same temperature, and it is an exceedingly easy matter to darken a very fine sample by overheating.

If by "*gently warming*," the temperature of "gentle heat," 32° to 38° C. (90° to 100° F.) is supposed, a greater temperature is obtained by simply mixing the glycerin and acid in the proportion named.

If 6 cc. of glycerin and 6 cc. of sulphuric acid are rapidly shaken together in a deep test-tube, an average temperature of 85° C. (185° F.) is produced, while it may rise to 90.5° C. (195° F.), dependent upon the sample and rapidity of mixing.

At this temperature the presence of a minute trace of cane sugar will impart immediate *blackness*, while if a slightly elevated temperature is maintained for ten minutes, the presence of glucose is easily demonstrated by the continuous deepening of color.

My method was to place 6 cc. of glycerin in a graduated test-tube, absolutely clean, run 6 cc. of sulphuric acid into it from a burette, and shake them rapidly together.

Failure to observe sufficient care here has led to wrong conclusion. color being imparted by organic matter other than that supplied by the glycerin; hence this test was applied three times to each sample.

The eleven samples were placed in a comparator, and their color compared and noted.

The test tubes were then suspended in a water-bath at a temperature of 94.4° C. (202° F.), all at one time, allowed to remain ten minutes, then all removed to the comparator and color compared and noted. Every sample developed some color under this treatment.

To secure uniformity in the application of the odor test, ten grams of glycerine and five grams of dilute sulphuric acid were well mixed in a test-tube and the tube suspended in a water-bath at 94 4° C. (202° F.) for fifteen minutes. The eleven samples were suspended in the bath together and all removed at the same time, the odor being immediately compared and noted.

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* Presented at the Fourth Session.

Eleven pieces of blue litmus paper laid upon a clean, dry, white surface, were moistened with the corresponding samples, taken from the bottles by means of clean glass rods, and the results compared and noted. All the samples failed to show any reaction with test solutions of nitrate of silver, chloride of barium, chloride of calcium, sulphide of ammonium, or oxalate of ammonium, indicating the absence of acrylic acid, hydrochloric acid, sulphuric acid, oxalic acid, iron or calcium salts.

Heated upon a sand-bath to boiling, and ignited, no more than slight residue was left in any case.

The sulphuric acid test and Fehling's solution failed to discover cane sugar or glucose in any of the samples.

But two of the eleven samples were deficient in gravity, and they *may* have been affected by water left in the bottle by the dealer furnishing them. Number ten was of unknown foreign make, but sold for a very fine sample.

The following table explains the relation of the samples to the pharmacopœial requirements, in particulars not already mentioned.

TABLE.

a.	b.	c.	d.	e.	f.	g.
No. of Sample.	Manufacture.	Action to litmus paper.	Sp.gr.	Glycerin and sulphuric acid, each 6 cc.	Same as *e* at 202° F.	Glycerin 10g. dilute sulphuric acid, 5g. at 202°F.
1	American.	Neutral.	1.253	No color.	Pale straw.	No odor.
2	"	"	1.254	Pale straw.	Brown.	Slight odor.
3	"	Slightly acid.	1.256	Light brown.	"	Marked odor.
4	German.	Neutral.	1.253	Pale straw.	"	Slight odor.
5	American.	Slightly acid.	1.254	"	Dark straw.	"
6	German.	Neutral.	1.255	"	"	"
7	American.	"	1.254	No color.	Pale straw.	No odor.
8	"	Sllghtly acid.	1.242	Pale straw.	Dark straw.	Marked odor.
9	English.	"	1.255	Straw.	Brown.	Faint odor.
10	Foreign.	Neutral.	1.256	Pale straw.	"	"
11	German.	Slightly acid.	1.245	Light brown.	"	Marked odor.

The majority of the glycerin of commerce conforms to the requirements of the Pharmacopœia in all particulars save that of containing a *small* excess of foreign organic matter.

GLYCERIN OF COMMERCE.*

BY ROBT. B. WARDER.

QUERY No. 34.—*How does the glycerin of commerce conform to the requirements of the Pharmacopœia?*

While the following paper was suggested by the query named, the products of the principal American manufacturers have also been compared with each other and with samples from retail druggists of a few central cities. The French and German goods sold in the East have not been included, except, perhaps, in a single sample, No. 18, which was labeled "Sarg's C. P. glycerin."

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* Presented at the Fourth Session.

SAMPLES.

Nos. 1–12 represent the manufacturers, and were all procured from original packages in the hands of wholesale dealers, except No. 2 and No. 10; these brands are in less frequent use than the rest, and samples were procured from the manufacturers, to save the expressage from distant places. No. 12 is a standard English brand, included for comparison. No. 3 and No. 12 are sold in pound bottles, at a much higher rate than most of the rest, which are sold in cans or casks. Nos. 13–20 were procured from retail druggists. Every effort was made to have perfectly clean and dry bottles; but circumstances did not allow me to see to this personally in every case.

COLOR, ODOR, AND NEUTRALITY.

Each sample was a colorless, viscid liquid, except No. 4, which had a pale straw color.

No odor was observed in the cold except in a single sample, which had the disagreeable, candle-like odor of crude glycerine. Personal observation convinces me that the same brand is not usually so contaminated.

When heated on the water-bath, with the addition of half a volume of water,* odors were observed in seven other samples—two of them were very slight. The retail samples averaged better in this respect than those representing the manufacturers.

No butyric or other acidulous odors were developed by warming with an equal volume of dilute sulphuric acid.

Very faint acid reaction was observed in some specimens after dilution with ½ volume of water, but not sufficient in any case to redden litmus paper that was distinctly blue. Negative results were also obtained (after dilution with ten volumes of water) with blue paper slightly inclined to purple. A purple paper should have been prepared for the purpose, but this was omitted till it was too late.

SPECIFIC GRAVITY.

The densities were determined by a specific gravity bottle, upon an accurate balance. Temperatures were noted (from 23.6° to 28.1° C.) and the density was calculated in each case for 15.5° C. by adding 0.0054 to the density found, for each degree Centigrade. The results are given in the table appended, and refer to the density of water at 4°C. It will be seen that only four samples are fully equal to the requirements of the Pharmacopœia, while Mr. Kennedy's determinations as reported to the Pennsylvania Pharmaceutical Association in 1884, showed very little deficiency in this respect. The bottles were all kept tightly corked until the determinations were made; and although Nos. 1–15 were examined on a damp day, the neck of the bottle used was large enough to allow of prompt filling and discharge, and the moisture absorbed during manipulation must have been inconsiderable.*

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* Mr. Kennedy recommends heating with the addition of water, but this is not required in the Pharmacopœia. See "Proc. Penna. Pharm. Assoc." for 1884, p. 136.

The bottle was carefully tested with distilled water. Reference to water at 15.5° C. instead of the maximum density, with the most liberal probable correction for the temperature of the glycerin, would scarcely add 0.002 to the densities reported. This margin of allowance would bring the majority within the limit 1.250; if the retail samples are diluted by five-tenths of one per cent. of water beyond the standard, this is as likely to arise from unavoidable circumstances as from intent or carelessness. Nos. 9 and 10 are not so high as we would expect from the claims of the makers.

ACRYLIC ACID, ETC.

Special importance is attached by manufacturers to the test with silver nitrate for acrylic acid and similar impurities, arising from a partial decomposition of fats. The Pharmacopœia states that there should be "no coloration," without specifying the time of action, nor the amount of exposure to light. Much care is required to secure absolute cleanliness in applying this test, as even traces of insensible perspiration from the fingers may invalidate the result. Twenty-two 2-drachm bottles with glass stoppers were accordingly very thoroughly washed; the lip of each sample bottle was carefully wiped with paper and then rinsed with a portion of the glycerin itself to be thrown away, before pouring into the test bottles. The latter were filled one-eighth full with the several samples; they were then filled half full with distilled water and well shaken, in order to diminish the viscosity, and facilitate the final mixing with the reagent. Each bottle was nearly filled with a five per cent. solution of silver nitrate, well shaken, and placed on white paper with uniform exposure to diffused light. The bottles were taken in order as numbered, and the last was in place five minutes after No. 1 had received the silver solution. Care was then taken to secure uniformity in the conditions.

The last two test bottles were filled with silver nitrate and distilled water for purposes of comparison. The bottles were observed from time to time during five hours' exposure to ordinary daylight; afterward they were kept in the dark, and observed at intervals for fifteen days. The more important changes are noted in the table. There was no immediate change of color in any sample; the promptness and speed of the deepening of color and formation of precipitate varied greatly. The observations could have been rendered more accurate by providing a series of standard colors in similar bottles from permanent materials, with which to compare the silver solutions reduced by the glycerin from time to time. The terms used must be understood to be relative merely, for the manufacture of glycerin in this country has been brought to such a degree of perfection that what would usually be called a very slight reaction is recognized in this test as a distinct color. A reddish or violet test usually appeared after a longer or shorter time, changing to gray as the precipitates began to form. The only appearance of a distinct lead gray in No. 8 was quite exceptional. The several samples did not maintain the same order of discoloration when observed at different times. Thus, after one or two hours, No. 12 was less limpid than No. 6; but after five hours the former seemed unchanged, while No. 6 was decidedly deeper. The amount of light present also has a very great influence; one test exposed near a window to diffused light from the clear sky became about as dark in twenty minutes as a duplicate test which had been prepared two hours before, and which faced the interior of a well-lighted room, but was protected from the direct glare of the windows. No. 4 had a decided precipitate after three hours; No. 10 had a smaller amount at the same time. Three samples only showed precipitate on the day of mixing; seventeen contained solid particles after three days; No. 12 alone was free from precipitate after ten days, and a few little specks were seen in this after fifteen days. The blank test containing silver nitrate and distilled water remained perfectly limpid for ten days, and showed only the slightest discoloration at the time of the last observation. This precaution was deemed needful to demonstrate the purity of the water used. The table shows considerable variation among the several brands, but no manufacturer should be condemned for the results of these experiments with single samples. Considerable variations among samples of the same brand have been noted. The requirements of the Pharmacopœia should be more definitely stated in the next revision; and if there should be sufficient demand for the utmost possible purity, an investigation should be made to determine the conditions needful to secure constant results—especially the influence of light, time, and excess of silver nitrate. With the present reading of the Pharmacopœia, probably not more than one of the samples would be condemned, as the analyst does not usually think needful to wait more than a few minutes for a reaction to take place. The retail samples average quite as well as those representing manufacturers.

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* Mr. Kennedy found that glycerine of 1.26 spec. grav. exposed to the atmosphere in an open flat jar absorbed 7% of moisture in seven days.—*Proc. Amer. Pharm. Assoc.*, for 1879, p. 726.

WHOLESALE DRUGGISTS.

No.	Specific gravity.	Color and precipitate with $AgNO_3$ after					
		½ hour.	1 hour.	2 hours.	5 hours.	3 days.	10 days.
1	1.248	1	3	4	4	C	E
2	1.250	1	3	3	3	B	B
3	1.247	1	3	4	4	C	D
4	1.248	4	5	7	B	E	F
5	1.253	1	3	4	4	C	E
6	1.249	1	1	1	3	B	B
7	1.249	1	1	1	2	A	B
8	1.253	1	4	6	6	C	D
9	1.229	1	3	4	4	C	F
10	1.244	2	4	7	B	E	F
11	1.258	1	2	3	3	A	D
12	1.248	1	2	2	2	A	A

RETAIL DRUGGISTS.

13	1.249	1	1	2	3	C	F
14	1.246	1	2	2	3	B	C
15	1.248	1	3	3	3	B	C
16	1.246	1	4	4	4	B	B
17	1.247	2	4	4	4	C	D
18	1.246	2	4	7	B	E	F
19	1.248	1	3	4	4	C	F
20	1.246	1	2	3	3	B	C

Explanation.

Color.	Precipitate.
1. None.	A. None.
2. Almost clear.	B. Very slight.
3. Very pale.	C. Slight.
4. Pale tinge.	D. Medium.
5. Pale violet.	E. Considerable.
6. Grey.	F. Heavy.
7. Distinct violet.	

TESTS FOR SUGARS, ETC.

1. *Evaporation Test.* The Pharmacopœia requires that not more than a black stain shall remain when about two grams of the glycerin are heated to boiling in a small capsule on the sand-bath, and then ignited, while sugar leaves a porous coal. It may be assumed that the lamp is to be removed when the vapors are ignited, but this is not expressly stated. Variations in the intensity of the heat led to some misleading results, and the following plan was finally adopted: About two grams of glycerin were poured into a small platinum crucible, which was placed in an inclined position (to facilitate access of air) deep in the sand-bath. When the liquid began to boil, the vapors were ignited and the lamp removed. The liquid then burned away to the last drop. Comparative tests were made with glycerin containing one-half per cent. of sugar, added as syrup to

insure solution. In this case a considerable mass of porous black residue was always left. The samples of glycerin nearly always left something more than a "black stain;" there were traces of porous substance of yellowish brown to dark color, which quickly swelled and carbonized when exposed to the flame. The volume of this residue before carbonization, even when most abundant, was judged to be about one-third as great as the residue left under like circumstances by the same quantity of glycerin containing 0.5% cane sugar.

2. *Sulphuric Acid Test.* The Pharmacopœia requires that glycerin shall not become dark colored when warmed with an equal bulk of concentrated sulphuric acid. Some preliminary experiments gave variations from a straw color to a deep amber with the same sample, on simply mixing the two fluids. Heating on the flame resulted in carbonization and frothing. Comparative tests were accordingly made with glycerin containing 0.5%, 1%, and 2% of cane sugar respectively; the first, when mixed with an equal volume of acid, became very dark colored, but was not quite opaque for some time. After a few hours it was black; the second and third tests became black and opaque at once.

Moderate variations in temperature may have marked influence upon the intensity of the reaction; and experiments were therefore made to see how much variation was likely to result from differences in the relative amounts of glycerin and acid. Ten cubic centimeters of each at 24° C., rose to 97° C., on being mixed, showing an increase of 73° from the reaction. Five cc. glycerin mixed with 10 cc. acid rose to 98° C. Ten cc. glycerin with 5 cc. acid rose to 91° C. It thus appears that considerable variations in the quantity of acid may produce little variation in the temperature, if the acid is in excess; but two liquids of such viscosity are liable to be imperfectly mixed in a test-tube, unless special care is taken. If an excess of acid remains in contact with the glycerin, it may first remove the water, and then begin a process of carbonization.

In several instances, where the liquids seemed to be thoroughly mixed, with the production of a straw color a darkening was observed near the bottom of the tube after some minutes, indicating that an excess of acid in that part had escaped thorough mixing. When no flame was applied to the mixture, a deep amber was the darkest color obtained; and this was characterized by strong fluorescence. The color in no case approached that produced immediately by glycerin No. 6 containing 0.5% of cane sugar. From these two tests we may safely conclude that no sugar or like materials had been added to any of the samples examined; but either the destructive distillation of pure glycerin or its dehydration with sulphuric acid may yield traces of substances of higher molecular weight very similar in deportment to sugar.

The use of Fehling's solution after prolonged boiling with acid, was considered superfluous for the object in view.

MINERAL IMPURITIES AND OXALIC ACID.

Diluted with ten volumes of water, each sample remained perfectly clear, with additions of barium chloride, calcium chloride, ammonium oxalate, and ammonium sulphide; sulphates, oxalates, calcium salts, and the heavy metals, are, therefore, absent. The residues left on evaporation were combustible, leaving no ash.

CONCLUSIONS.

The twenty samples tested conform very nearly to the requirements of the Pharmacopœia, though a very slight excess of moisture is indicated in several instances; one sample had a very disagreeable odor; one also had some color, and gave distinct reaction with silver nitrate within half an hour The manufacturers maintain a high standard of excellences; and retailers, so far as observed, do not adulterate the goods in their stores. It should be mentioned in this connection, however, that adulterations are not unknown in the east. Cane sugar seems to be generally used for this purpose, since glucose is very readily detected by Fehling's solution.

ACKNOWLEDGMENT.

My sincere thanks are due to Prof. J. U. Lloyd, for many suggestions during the course of this investigation.

COMMERCIAL CHLOROFORM.*

BY P. W. BEDFORD.

QUERY NO. 45.—*Will the chloroform of commerce conform to the requirements of the United States Pharmacopœia?*

An examination of the brands of chloroform, made in answer to this query, leads us to respond that the result is very satisfactory. The brands examined were those of Mallinckrodt, Powers & Weightman, C. Pfizer & Co., Dr. E. R. Squibb, and the Albany Chemical Works.

The examination was in accordance with the tests of the United States Pharmacopœia, and the tabulated statement below has no reference in the order given to that of the names of the manufacturers.

These tests are specific gravity, freedom from acidity, absence of chlorides or free chlorine, aldehyde, the freedom of substances of organic nature, as indicated by their imparting color to sulphuric acid, and the absence of foreign odor.

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* Presented at the Fourth Session.

	Sp. gr.	Acidity.	Chlor des.	Free chlorine.	Aldehyde.	Blackening by sulphuric acid.	Foreign odor.
1	1.480	None	None	None	None	None	None.
2	1.480	"	"	"	"	"	Very faint.
3	1.460	"	"	"	"	Pale straw after ten hours	None.
4	1.478	"	"	"	"	Pale straw after ten hours	"
5	1.486	"	"	"	"	A shade of color after six hours.	"

It will be observed that in specific gravity, all the samples but one are a trifling amount under that named in the United States Pharmacopœia, which gives the figures 1.485–1.490; after twenty-four hours color was imparted to sulphuric acid, in three as above noted; and the color in two of these, at the expiration of that time, was in one scarcely noticeable except when viewed against a white background, while in the others it had not darkened beyond a very light yellow color, while the absence of all other impurities, which the standard authority enumerates, is in this chemical quite noticeable.

During the past year Mr. A. L. Langfeld, of San Francisco, made similar experiments, his results being somewhat similar, except that in specific gravity the samples averaged better, all but one being fully up to requirements. He noticed the presence of formic acid in slight traces in all samples. His experiments came to my notice quite recently, having been published in the proceedings of the California Pharmaceutical Society about a month ago.

III. MATERIA MEDICA.

EXPORTATION OF AMERICAN DRUGS.*

BY LOUIS A. HABER.

QUERY No. 2.—*What American drugs are imported, and in what amounts?*

In endeavoring to prepare an answer to this query, I have met with considerable difficulty; first, on account of its large scope, and secondly, on account of want of time to carry on a more extensive correspondence.

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* Read at the Fourth Session.

I infer from the query that the amount of chemicals exported, and which are used in the arts as well as by the pharmacist, is not desired. I find it necessary, however, before answering the query, to give the total value of drugs, chemicals, dyes and medicines which were exported during the year ending

June 30, 1885, which was	$4,806,186
For the year ending June 30, 1884	4,694,386
An increase in 1885 over 1884 of	$111,800

or about two and a quarter per cent. The bureau of statistics at Washington has divided this total exportation into seven classes, the quantities and values of each being as follows:

For year ending June 30, 1885, the value of the different acids was	$133,582
Ashes, pot and pearl, 775,582 pounds	37,782
Dyes and dye stuffs	656,148
Ginseng, 377,345 pounds	751,168
Medicines, patent or proprietary	1,317,483
Roots, barks, seeds and flowers, n. e. s.	116,695
All other	1,793,328
Total drugs, chemicals, dyes and medicines	$4,806,186

It will be interesting to notice in this statement that the exportation of roots, barks, seeds and flowers in 1885 was almost triple of that in 1884, while the exportation of patents fell off $23,100 during the same time. The changes in amounts of the other classes for these two years have been slight.

The acids exported consisted of acetic, muriatic, carbolic and sulphuric. Blue vitriol is also frequently shipped by the acid manufacturers.

The American roots, barks, seeds and flowers exported (principally to Europe) I have divided into two classes, A and B. Class A represents those sold in lots of 500 to 2,000 pounds. Class B represents those sold in lots of 50 to 100 pounds.

The articles constituting Class A are:

Mandrake Root,
Bayberry Bark,
Lobelia Herb,
Senega Root,
Barberry Bark,
Barberry Berries,
Black Cohosh,
Blue Cohosh,
Sassafras Root Bark,
Cascara Sagrada,
Stillingia Root,
Pleurisy Root,
Slippery Elm Bark,
Beth Root,
Cotton Root Bark,
Turkey Corn Root,
Balmony Herb,
Wahoo Root Bark,
Snake Root,
Grindelia Robusta,
Cransbill Root,
Skunk Cabbage Root,
Prickly Ash Bark,
Culver's Root,
Witch-hazel,
Scullcap Herb,
Golden-seal Root,
Blood Root,
Yellow Jessamine Root,
Moccasin Root.
Unicorn,
Hydrangea,
Wild Cherry Bark,
Ginseng.

These are the principal ones. Messrs. Chenny & Myrick, of Boston, inform me that it is fair to estimate the exportation from the United States of articles like mandrake, Culver's root, golden seal, senega, lobelia, etc., as ten tons annually.

Class B consists of those not called for so often, as:

Betony Weed,
Ladies' Slipper,
Bitter Root,
American Centaury,
Cramp Bark,
Dogwood Bark,
Dwarf Elder,
Marsh Rosemary Root,
Rosin Weed Root,
Agrimony Herb,
Dragon Root,
Indian Hemp Root,
Indian Physic,
Black Haw,
Wintergreen,
Tamarac Bark,
Yellow Parilla Root,
Red Osier Bark,
Prickly Ash Berries,
Red and Black Alder Bark,
Wickop Herb,
Spice Wood Bark,
Life Root,
Mullein,
Stone Root,
Wild Yam Root,
Ptelea or Wafer-ash,
Crowley Root,
Avens Root,
False Bitter Sweet,
Cleavers.
Meadow Fern.

There are, of course, some others for which an occasional call is received, but the quantities exported are so small that it is hardly necessary to mention them in this paper.

A number of firms ship large quantities of those that I have mentioned, pressed in pound packages, as well as of their fluid extracts. Among the most prominent are the golden-seal, stillingia, yerba santa and cascara sagrada. These firms also manufacture large quantities of solid extracts, which are afterwards used in the production of different medicines upon the foreign markets.

Concentrations are also a feature of their export business, including quantities of podophyllin, euonymin, gelsemin, irisin and hydrastin. Among the specialties which have received attention in the foreign markets is cocaine and distilled extract of witch-hazel.

Of other drugs of different characters, such as oil of peppermint, oil of sassafras, oil of wintergreen, and drugs of minor importance, there were exported, especially to Europe and South America, during the first half of 1884, $723,355 worth, during the second half $639,972, and during the first three months of the present year $289,010.

Of the 377,345 pounds of ginseng exported, China received nearly all. In 1884 of the 295,242 pounds of ginseng exported, all but 38 pounds was shipped to China. During this year (1884), Germany was the heaviest purchaser of dyes and dye-stuffs, having bought $294,089 worth, Germany also took the lead over the other nations in her purchases of roots, herbs and barks. Quebec, Ontario, Manitoba, and N. W. Territory, received $52,218 of the different acids, while England led all the other nations in her purchases of patent medicines, having bought the enormous sum of $397,389 worth.

I desire to express my thanks for valuable information concerning this subject to Messrs. Chenny & Myrick, Boston; Wallace Bros., Statesville, N. C.; Messrs. Lehn & Fink, N. Y.; Parke, Davis & Co., Detroit; Eisner & Mendelson, Phila., Pa.

ARCTIC VEGETATION. *

BY GEORGE W. KENNEDY.

A few weeks ago the writer was invited to view a very interesting collection of plants—interesting not only because of their exceptional rarity, but of the circumstances under which they were collected, being relics gathered by Sergeant Joseph Elison, one of the victims of the Greely Arctic exploring expedition. Sergeant Elison was an enthusiast on botanical subjects, and while in the Arctic region collected and preserved quite a number of floral specimens, which were sent to the Agricultural Department at Washington on his death, and there arranged and classified and sent to Sergeant Elison's brother in Pottsville, Pa. The plants were gathered in north latitude 81° 44′, at a point about four and a half miles north of Lady Franklin Bay. They were gathered in the months of July and August 1883 and 1884. The prevalent idea that this region is one of perpetual cold is contradicted by Sergeant Elison, and at the expense of his life. In the months of July and August the sun comes out quite warm, and vegetation, although stunted and short-lived, is not a rarity.

I have examined these plants with a great deal of pleasure, and thinking the subject might be of some interest to the members of this association, I have taken a list of them, which is here appended. The plants vary in height from two to six inches, and under a magnifying glass present a very beautiful appearance. There were thirty-four plants in all preserved and forwarded to Washington; of this number there were but two which could not be named. For the balance of thirty-two the generic names are given, and in most cases also the specific names. There are but two acotyledonous plants, the rest being phænogamous or flowering plants.

1. Androsace septentrionalis, *L.*
2. Arctagrostis latifolia.

3–7. Carex, five different species or varieties.

8. Draba alpina.
9. Equisetum variegatum, *Schleicher.*†
10. Equisetum palustre, *L.*†
11. Epilobium latifolium, *L.*
12. Erigeron uniflorum, *L.*
13. Erigeron compositum.
14. Eriophorum polystachyon, *L.*†
15. Lychnis apetala.
16. Luzula arcuata, *Meyer.*†
17. Luzula ———.
18. Potentilla nivea, *L.*
19. Poa cæsia, *Smith.*†
20. Poa cenisia, *Allioni.*
21. Poa arctica.

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* Presented at the Fourth Session.

† Found in Gray's Botany.

22. Polygonum viviparum, *L.**
23. Pedicularis lanata, *Pallas.*
24. Papaver nudicaule, *L.*
25. Ranunculus affinis.
26. Ranunculus glacialis, *L.*
27. Saxifraga cernua, *L.*
28. Saxifraga flagellaris.
29. Saxifraga tricuspidata, *Retz.**
30. Saxifraga rivularis, *L.**
31. Taraxacum officinale, *Weber.**
32. Triosteum subspicatum.

DANDELION AND CHICORY.†

BY JOSEPH FEIL, PH. G.

While examining quite a number of specimens of dandelion recently, the writer was surprised to find so many mediocre and poor samples, which undoubtedly were genuine drugs as far as relates to origin, but when considered from a medicinal standpoint were entirely worthless: on the other hand, a few specimens of chicory examined proved to be fully equal to the best dandelion; the test used was the comparative bitter taste of the drugs. Another fact observed was that while dandelion with the care, or rather want of it, usually bestowed on vegetable drugs in American pharmacies, will scarcely keep over one season, chicory will remain in comparatively good condition for several years.

That these drugs can be only judged by their more or less bitter taste, of course excepting their physical condition, is evident by the fact that its absence always shows want of proper medicinal action.

Another well known fact is that well made fluid extracts of good dandelion and chicory are undistinguishable, and according to all medical authorities, are possessed of precisely the same medicinal virtues and action when exhibited in the same doses.

With these various facts in view, the writer would suggest the replacement of dandelion by chicory in the U. S. P., 1890. The reasons in brief for preferring chicory are:

1. The medicinal action of both is the same.
2. Chicory is usually found in the market of good quality.
3. Chicory costs considerably less than dandelion.
4. Judging by the taste, it is stronger than nine-tenths of the dandelion found in this market, and equals the best quality of the latter drug.

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* Found in Gray's Botany.

† Read at the Fourth Session.

ON THE MEDICAL PROPERTIES OF TWO RHAMNUS BARKS.*

BY GEORGE W. KENNEDY.

QUERY No. 21.—*Is there any difference in the laxative action of Rhamnus Purshiana and Rhamnus catharticus?*

Experiments undertaken with the view of answering this query require considerable time and labor, since a number of important points are to be taken into consideration in order to be able to reach a satisfactory conclusion, and the omission of either one will cause more or less uncertainty in the results. One of these results is the proof that the two drugs under consideration require somewhat different menstruums for stable liquid preparations, since the menstruum which will thoroughly exhaust the virtues of one of the drugs and hold the principles in perfect solution, will not answer for the other. In order to ascertain if possible the relative strength of these two drugs, the fluid extracts were believed to be the most convenient and satisfactory form for experimentation, and they were prepared as follows:

Take of the bark in moderately fine powder	℥xvj.
Alcohol (95 per cent.)	f. ℥xj.
Glycerin	f. ℥ij.
Water	f. ℥iij.

Mix the above fluids, moisten the powder with a portion of the mixture, pack properly in a glass conical-shaped percolator, cover the surface of the powder with a disc of paper, and add the remaining menstruum. When the liquid begins to drop from the percolator, close the lower orifice with a cork, and having closely covered the percolator, to prevent evaporation, set it aside in a moderately warm room for four days. The cork is then removed, more menstruum, composed of eleven fluid ounces of alcohol and five fluid ounces of water, is added gradually, and the percolation continued until twenty-four fluid ounces are obtained, of which the first thirteen are reserved; the remainder is carefully evaporated to two fluid ounces, then add one fluid ounce of alcohol, and mix with the reserved portion.

This menstruum is not sufficiently strong in alcohol to make a permanent preparation of *Rhamnus catharticus;* but, by increasing the alcohol in the above formula to twelve fluid ounces in the pint, excellent results were obtained, and no precipitation of any consequence took place in the fluid extract after standing for several months. When made of the weaker alcoholic menstruum a deposit took place shortly after the preparation was finished, but none occurred in the fluid extract of *Rhamnus*

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* Presented at the Fourth Session.

Purshiana, which was made about nine months ago. The taste of the two preparations differs somewhat; while that of *Rhamnus catharticus* is unquestionably very bitter, yet it is not near so strong as the bitterness of the *Rhamnus Purshiana*.

To satisfy myself that the drugs were thoroughly exhausted, the powders were administered, and found to have no laxative properties whatever. The precipitate alluded to above, a portion of which I collected by decantation, was of a brownish color, and dissolved completely in liquor potassæ, with a deep purplish-red color, characteristic of the resin. By the addition of dilute acetic acid the purplish-red color of the alkaline solution was immediately destroyed, and a brownish-colored mass thrown down, which was thrown into a filter, repeatedly washed with water, and dried. It is soluble in alcohol, diluted alcohol, and the alkalies, insoluble in chloroform and ether, and nearly so in water, thus corresponding in appearance and tests with the rhamno-cathartin found in the juice of the buckthorn berries by Binswanger, in 1849. Repeated attempts to crystallize this substance were not successful. On being administered in four-grain doses it had a decided cathartic action, and in doses of three grains was strongly laxative.

The separation of this substance from the fluid extract induced me to investigate the subject a little deeper than at first intended. Accordingly a small quantity of the resin was made from each bark by a process noticed below, and the yield ascertained, as well as the medicinal action. In the meantime the fluid extracts were placed at the disposal of several of my medical friends, who rendered me valuable aid and reported their conclusions, which agree so closely in the more important points, that it would be surperfluous to give them all in detail.

The following report from Dr. I. D. Wiltrout, of Hudson, Wis., appears to cover the subject quite thoroughly:

The samples of fluid extract of *Rhamnus catharticus* and *Rhamnus Purshiana* given me for trial have more than met my highest expectations. I used these preparations in cases of constipation characterized by atony, or paresis of the muscular coat of the bowels, induced by a catarrhal condition of the stomach and small intestines. They gave free evacuations in small doses, say from 30 to 50 drops, with no pain, and materially improved the appetite. The evident action is upon the nerve terminals, and in this way, by reflex, stimulating muscular contractibility and glandular secretions. The common experience was that a diminished dose was needed to assure the daily purpose. I also used the remedies on women in whom the colon was allowed to distend from neglect and inattention; in all ins'ances they were efficient. I think these remedies might be usefully prescribed with aloes when there is no pelvic or uterine difficulty, and thus act on the whole bowel. I have prescribed these remedies in combination with the phosphate of sodium in chronic constipation, attributable to a bilious condition. It wonderfully accelerates the action of the phosphate, and arrests a sick headache promptly, and does not deplete the system. I think these remedies have a wide province, and if the extracts are always as reliable as those you sent, will be used in the cases enumerated. I have prescribed these remedies in a large number of cases, and my conclusion as to their relative strength is, that a smaller quantity of the *Rhamnus Purshiana* is required both as a laxative and as a cathartic, but it is a little nauseating."

In regard to the squeamish action of the drug noticed by Dr. Wiltrout, in the *Cascara sagrada*, this has likewise been observed in the bark of the *Rhamnus frangula* the first year after gathering, but when two or three years old it retains only the purgative power, and is much similar in its effect to that of rhubarb; consequently most authorities forbid its use until two years from the time it is gathered, and the Norwegian Pharmacopœia requires the bark to be kept one year before it is used medicinally. The glucosic fermentation, which is now admitted to take place by age in the *Frangula*, may likewise take place in the *Purshiana*. On this point I am unable to give an answer, as I could not ascertain the age of the bark operated on.

The resins of both species were obtained from the concentrated alcoholic tinctures by adding them with constant stirring to water, when subsidence had taken place, decanting the supernatant liquids, washing the precipitates twice by decantation with fresh portions of water, and drying them.

Eight ounces of the bark was operated on in each case. The bark of *Rhamnus Purshiana* yielded 250 grains, or about $6\frac{3}{10}$ per cent. of resin, which is dark in color and almost black, but if dissolved in caustic potash solution and precipitated by diluted acetic acid it is of a brown color. It is very bitter, of a granular appearance, and contains a small quantity of a yellow fixed oil, which on a piece of white paper produces a greasy stain. The resin is soluble in alcohol, in diluted alcohol, in sulphuric acid with a reddish-brown color, and in liquor potassæ with a purplish red color; it is insoluble in chloroform and ether. In doses of 1 to 3 grains it acted as a laxative and cathartic. The extractive matter obtained by evaporating the water used in precipitating the resin amounted to $1\frac{1}{2}$ ounces, or $18\frac{5}{10}$ per cent., making a total yield of both of $24\frac{8}{10}$ per cent. The watery extract is of a dark reddish-brown color; when perfectly dry breaks with a snap, the fracture being glossy, but when exposed to damp air it becomes soft and sticky; it has an intensely lasting bitter taste, much stronger than the precipitated resin, and its physiological action is similar, 2 to 3 grain doses having laxative effects, and 5 grains acting as a cathartic. It is soluble in a large quantity of water, freely so in dilute alcohol, sparingly soluble in alcohol, and almost insoluble in chloroform and ether; with sulphuric acid it forms a reddish-brown solution, and with liquor potassæ makes a clear solution of purplish-red color.

The yield of resin from the *Rhamnus catharticus* is not so large as from the former, 8 ounces yielding 160 grains or $4\frac{1}{6}$ per cent., and by evaporating the aqueous fluid used in precipitating the resin 210 grains or $5\frac{5}{10}$ per cent., making a total of 370 grains or $9\frac{2}{3}$ per cent. The resin is found to be soluble in diluted alcohol, in alcohol, in liquor potassæ with a claret wine color, in sulphuric acid with a red color, also in ether and chloroform, but insoluble in water. The aqueous extract was soluble in water, sparingly soluble in alcohol, soluble in dilute alcohol, insoluble in ether and chloroform, soluble in liquor potassæ with a purplish-red color, and in sulphuric acid with a reddish-brown color. As to the laxative and cathartic properties of these two, I found the resin decidedly the stronger, requiring 3 grains for a laxative action, while the aqueous extract required 4 to 5 grains to have the same effect.

From the above observations on the resins and extracts obtained from these barks, I would unhesitatingly conclude that the preparations manufactured from *Rhamnus Purshiana* are decidedly the more active. Before closing, I desire to return my thanks to Messrs. Parke, Davis & Co., of Detroit, Mich., who kindly accommodated me with material to make these investigations.

ON THE VOLATILE OILS OF PEPPERMINT AND SPEARMINT.*

BY HENRY TRIMBLE.

What is the chemical relation, if any, between the oils of peppermint and spearmint?

In answering this query, it is necessary to assure the Association that the following experiments were made on pure oils. The purity of the samples was vouched for in every case by those who were personally acquainted with their manufacture.

Sufficient investigation has already been made of spearmint oil to prove that it is different from oil of peppermint, consequently attention has been directed to determining whether there is *any* chemical relation between them, and at the same time corroborating the work already done by others.

History.—Oil of spearmint appears to have been correctly analyzed by Gladstone ("Journal of Chemical Society," 1864), who stated that it consisted of a terpene, $C_{10}H_{16}$, and carvol, $C_{10}H_{14}O$. He separated them by fractional distillation, and by precipitating carvol by means of alcoholic ammonium sulphide.

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* Read at the Fourth Session.

The result is a mass of beautiful acicular crystals, readily purified by solution and recrystallization from hot alcohol, and, when pure, free from odor, composed of $(C_{10}H_{14}O)_2H_2S$. This compound, decomposed by ammonia, yields carvol, which has an odor resembling spearmint, although distinct from it. With the exception of the odor, this carvol appears to be identical with that from the oils of caraway, dill and nutmeg. The oil examined by Gladstone showed a specific gravity at 14.5° C. of .9105.

Experiments on Oil of Spearmint.—Three samples were kindly furnished me by Mr. Albert M. Todd, the well-known manufacturer of pipmenthol. 1. A light fraction; 2. A heavy fraction; and 3. The natural oil. The light portion boiled at 174° C., had a specific gravity of .9078 at 15° C., and failed to deposit anything except water, at —23° C.

It was distilled under reduced pressure with a two-ball fractioning tube. The light portion of this process was repeatedly rectified in the same way until a product was obtained of specific gravity .866 at 15° C., and boiling at 160° to 165° C. This was found on combustion to contain over three per cent. of oxygen. The odor of spearmint had disappeared, a peculiar terebinthinous odor replacing it. The supply of this being exhausted, the natural oil was fractioned, the light portion treated with metallic sodium and distilled from it three times.

A combustion of this gave the following:

Carbon	84.42
Hydrogen	12.28
Oxygen	3.30
	100.00

It was then allowed to stand over sodium for two weeks, and distilled. The first portion which came over boiled at 160° to 167.5° C., and had a specific gravity of .861 at 15° C. A combustion of this gave:

Carbon	84.52
Hydrogen	12.27
Oxygen	3.21
	100.00

According to Gladstone, the pure hydrocarbon boils at 160° C., and has a specific gravity at 20° C. of .860.

Another attempt was made to get the pure hydrocarbon by treating the oil with alcoholic ammonium sulphide, to remove the carvol, and rectifying the filtrate. But a decomposition occurred on heating this filtrate, and a greenish oil containing sulphur distilled over.

The second fraction in the distillation of the volatile oil, consisting largely of carvol, was submitted to a temperature of —23° C. No separation of crystals occurred.

There remained in the flask after distillation, whether by direct heat or by forcing steam through the oil, a thick, dark brown, resinous substance, almost free from the odor of spearmint, and apparently a usual constituent of the oil. This will be referred to again under peppermint.

Experiments on Oil of Peppermint.—The oil of peppermint exposed to temperatures varying from —10° to —23° C. did not deposit crystals. It was then fractioned under reduced pressure, and the heavy portion crystallized by exposure to a low temperature.

For experiments on the light product of the oil, I used a sample sent me by Mr. Todd, who, at my request, favored me with about 4 ounces of a light oil, being the distillate gotten by taking 120 pounds of natural oil, distilling 5 pounds, taking 28 ounces of this and distilling 4 ounces. This was treated and distilled three times with sodium, and then submitted to combustion, with the following result:

Carbon	84 08
Hydrogen	12.19
Oxygen	3.73
	100.00

As this contained so much oxygen, it was allowed to stand on sodium for a week. The light portion gave on combustion:

Carbon	83.96
Hydrogen	12.28
Oxygen	3.76
	100.00

This boiled at 163° C., and had a specific gravity of .855 at 15° C. Gladstone gives 175° C. as the boiling point of the hydrocarbon $C_{10}H_{16}$, and the specific gravity .8602 at 20° C. He does not, however, give his method of separation, and I fail to find that anybody has ever separated this compound. I do not give the result of the combustions as evidence that there is no hydrocarbon present, but to show that it exists in very small quantity, and that it is isolated with extreme difficulty, as already shown when the light portion resulting from the distillation of 120 pounds of the oil, rectified twice by Mr. Todd, still contained oxygen after prolonged treatment with sodium. Mr. Todd states as his opinion that the amount of hydrocarbon does not exceed 5 per cent. It is probable there is not even that much present. It is well known that a very small proportion of the hydrocarbon will prevent the crystallization of the pipmenthol.

After the distillation of the heavy portion of the oil, there remained a resinous mass very similar to that obtained from spearmint oil. It is probable that both oils contain this resin, and that the quantity is increased during the process of distillation. This view is the result of experiment, as well as of a statement from Mr. Todd that the distillate, in fractioning the oil, increases in specific gravity until the middle or latter part of the operation, when it begins to decrease, which is due, no doubt, to a decomposition, resulting in the formation of the resin.

SUMMARY.

1. The oils of spearmint and peppermint probably contain hydrocarbons which are identical.
2. These hydrocarbons exist in much smaller proportion than heretofore supposed, and are isolated with great difficulty.
3. Oil of spearmint contains, as the oxygenated portion, carvol, $C_{10}H_{14}O$, which does not solidify at —23° C., and is precipitated by alcoholic ammonium sulphide.
4. Oil of peppermint contains, as the oxygenated portion, pipmenthol, $C_{10}H_{20}O$, which is a crystalline solid at ordinary temperatures, and is not precipitated, when in solution, by alcoholic ammonium sulphide.
5. Both oils contain resins, almost free from odor, and formed in part during the process of distillation.

IMPORTED MENTHOL.*

BY P. W. BEDFORD.

QUERY No. 9.—*What proportion of the menthol of commerce is now imported?*

The answer to this query can be made almost as brief as the query itself. From inquiries made, I learn that the imports of menthol for last year were about 4000 pounds, and that the present year it is larger, and it is estimated will reach fully 5000 pounds. One portion of this is received direct from Japan, while a part of it comes by way of Europe. Of the domestic article there is but one producer, and while his product is meeting increased demand, we are unable to make any definite statement as to the quantity produced.

Menthol is finding new uses, and besides the popular form of cones as a domestic remedy for headaches, it is being used internally, and has been tried with success as a local anæsthetic. It is fair to presume, in spite of the harm done to the legitimate uses of menthol by various manufacturers who have been sending out a much-diluted article in the form of cones, that the necessity for menthol production will rather increase than diminish, and we may look for imports of fully 6000 pounds in 1886.

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* Presented at the Fourth Session

ON THE PURITY OF COMMERCIAL SPANISH SAFFRON.*

RY JOHN M. MAISCH.

In order to obtain samples of Spanish saffron which would fairly represent its commercial quality, it was not deemed advisable to procure them from retail stores ; but at the writer's request, a friend, who uses considerable quantities of saffron in his business, procured a number of samples directly from importers and large dealers, in the summer of 1884, so that the results of my investigation may be assumed to indicate the actual condition of the market in Spanish saffron as held in first hands. Two firms had each sent a specimen of Valencia and Alicante saffron, with the statement that the former was of their own importation, and the latter merely kept to supply to customers purchasing cheap goods. In the following synopsis the samples are grouped together in accordance with their relative purity, and are designated as was done by the dealer ; the samples not specially designated are understood to have been received simply as "Spanish saffron."

1. Valencia saffron. Of good appearance and odor, supple but not clammy ; consists of the stigmas with a moderate proportion of the yellow style attached, and mixed with few stamens and a still smaller number of fragments of petals.

2. Valencia saffron. Closely resembling the preceding, and containing the same admixtures, in about the same proportion, except that the pollen seems to be present in somewhat larger quantity ; this pollen floats upon water, does not separate a white sediment, and does not effervesce with acids.

3. Valencia saffron. Like the preceding sample, with which it closely agrees in all respects.

4. Valencia saffron. Resembles the preceding sample, but contains decidedly more of the style, which in some cases measures over 25 mm. (1 inch) ; stamens and corolla fragments are present in moderate proportion.

5. The appearance of this sample is good, but very deceiving. It is free from stamens and powder, and contains but few styles, and corolla tubes, also a few fragments of green crocus leaves, the latter doubtless an accidental admixture ; but it is largely adulterated with calendula florets, dyed with red saunders in close imitation of the color of the stigmas of crocus.

6. Commercial Spanish saffron. Resembles the preceding sample ; is free from corolla tubes, but contains, besides some styles, a few corolla fragments and many calendula florets dyed with red saunders.

7. This sample resembles those marked "Valencia saffron :" it con-

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* Read at the Fourth Session.

tains a rather larger proportion of styles with a few corolla fragments, and is free from stamens; but it is loaded with a powder consisting of pollen and a moderate amount of calcium carbonate.

8. Although slightly clammy, the appearance of this sample does not excite suspicion; it contains a considerable proportion of styles, some yellow stamens and yellow calendula florets; but the principal amount of adulteration is dyed with Brazil wood, and consists of stamens, corolla shreds, corolla tubes, calendula florets, and of a powder composed of little pollen with much calcium sulphate.

9. Alicante saffron. More clammy than the preceding and resembling it, but free from calendula florets and the mineral adulteration consisting of calcium carbonate.

10. Identical with the preceding in composition and appearance.

11. This sample, weighing only a few grains, consists principally of corolla tubes with adhering powder of calcium carbonate, both dyed with Brazil wood, and containing a small proportion of saffron.

12. Likewise a very small sample, consisting largely of crocus stamens and corolla tubes, with adhering powder of calcium sulphate, all dyed with Brazil wood. Some of the crocus stigmas are rather light colored, and have probably done service before, yielding now a rather pale, reddish-yellow infusion.

13. Does not contain a particle of crocus, but consists exclusively of florets of *Carthamus tinctorius*, Lin., collected shortly after the expansion of the flower-heads, when they are of a bright orange-yellow color, and on drying acquire a red tint. The thin cylindrical tube of these florets is from 8 to 12 mm. (⅓ to ½ inch) long, and is above divided into five linear-lanceolate lobes, 6 or 8 mm. (¼ or ⅓ inch) in length; of about the same length is the yellow tube of the anthers, from which two short lobes of the stigma and a portion of the yellow top of the style projects about 2 to 6 mm. (1/12 to ¼ inch); this portion of the style is cylindrical, and, like the outside of the terminal lobes, finely hairy, while the long lower portion of the style is filiform, smooth, and of an orange-red color.

A few weeks ago, on learning of a recent importation of Valencia saffron, application was made to the importer for samples, which were obligingly furnished. Each of the two samples weighed 30 grains; and, since both were of very good appearance, entirely free from mineral additions, and had only moderate portions of the styles present, they were carefully searched for all other impurities present. In No 14 were found two stamens and two corolla shreds not dyed, while from No. 15 were obtained three stamens of their natural color, and the following substances dyed with Brazil wood, namely, one corolla tube, two corolla shreds, and two calendula florets. The weight of these latter impurities is quite insignificant—less than one grain—and their presence in the samples may probably be accounted for by accident rather than design, although in lots of several hundred weights of saffron the addition of two or three per cent. of material of no value would yield a snug profit, for which the purchaser did not contract to pay. This remark applies also to samples Nos. 1 to 4, described above.

Before referring to the different admixtures and adulterations, I may be permitted to state as the result of this investigation, my conviction that while Spanish (Valencia) saffron of fair quality can readily be obtained in our market, a large proportion of it (Alicante saffron) is more or less heavily adulterated; at the same time it should be remarked that not one of the samples is as good as it should be. There are upon the table three specimens of absolutely pure saffron, consisting solely of the stigmas without a trace of the yellow style, and of which one came to this country from Germany in 1871, as a special sample, another was raised in Lancaster county, Pa., about the year 1868, and the third was produced in Lebanon county, Pa., in 1882. It is to be regretted that the home product cannot be procured in sufficient quantity to supply our market; this condition of affairs might perhaps be altered in the course of a few years, if dealers would consent to pay the price demanded by the domestic producers of saffron—namely, an equal weight of silver coin. Sample No. 13 seems to indicate that some persons are still selling safflower in the place of Spanish saffron.

In the investigation of the samples procured in 1884, no attempt was made to determine the percentage of impurities; but that there are different grades of "Valencia" saffron in the market, and that "Alicante" saffron is manufactured so as to contain sometimes much more than half its weight of crocus stigmas, becomes evident when price lists are consulted. In proof of this assertion, the following statements are quoted from a trade circular from the southern part of France, issued near the close of July, 1885:

"No fresh supplies being brought to the Valencia market on account of the cholera there, stock has decreased to about 10,000 pounds, and although business appears at a standstill for the moment, prices are kept firm and show an upward tendency. *Real extra superior Valencia* is wanting. *Superior Valencia* is being kept at francs 81.75 to f. 83.75 per kilo f. o. b. (= 29 shil. 8 pence to 30 shil. per lb. f. v. C.), and *good pure Valencia* fetches from f. 78.75 to f. 77— per ko. f. v. C., as to quality (=28 shil. 7 pence to 27 shil. 11 pence per lb f. o. b.). For *Alicante* adulterated saffron our makers on the spot ask, say for *extra superior Alicante* f. 52— per ko. f. v. C. (= 18 shil. 10 pence per lb. f. o. b.), and for *lower grades* from f. 40— to f. 30— per ko. f. o. b. as to quality (= 14 shil. 6 pence to 10 shil. 10 pence per lb. f. o. b,). All above quotations to be understood for cases of $\frac{4}{4}$ tins, each of 25 lb. net."

Nearly all European writers on materia medica have, during the present century, regarded French as being superior to Spanish saffron. A. L. A. Fée (Hist. Natur. Pharmac., 1828, i., 341), Guibourt, (Hist. Natur. des Drogues simples, iv.), Soubeiran (Nouv. Diction. des. Falsif., etc., 1874, p. 494), Baillon (Botan. Médic. 1884, p. 1422), and other French authors, describe Gâtinais saffron as the best and purest, containing but few styles, while the saffron from Angoulème and Avignon contains a considerable quantity of this admixture. Soubeiran also states that Spanish saffron (doubtless the best quality is meant) differs little from that of Gâtinais, contains fewer yellow threads, and is more dry and red; but that it is frequently adulterated. The same general judgment is also alluded to by Andrew Duncan (Edinb. New Disp., 1805, p. 209), and by W. T. Brande (Manual of Pharmacy, 1825, p. 72), and is expressed by German and Austrian writers, who, however, place before the Gâtinais saffron that of Austrian origin, which consists of good-sized stigmas, is free from styles and other impurities, but is produced in insufficient quantity to exert any important influence on the general market, conditions which apply equally well to the excellent saffron of Pennsylvania origin. Bentley and Trimen (Medic. Plants, p. 274), and Flückiger and Hanbury (Pharmacographia, p. 668), likewise state that French saffron is usually purer and enjoys a better reputation than that of Spain or Italy. How then, it may be asked, does it happen that in the United States, Spanish saffron is regarded as the best kind, and that most American writers praise it as such? In searching the literature on this subject, it was found that in 1834 (see Buchner's Report, vol. 49, p. 458), F. Jobst pronounced the best and dryest kind to be the Spanish saffron, which formerly had been usually oiled, a fact mentioned by J. A. Paris (Pharmacologia), A. T. Thomson (London Dispensatory, 3d edit., 1822, p. 267), F. P. Dulk (Phar. Boruss. Comment., 1829, i. 405), and others, and subsequently repeated by Royle (Mat. Med., Amer., edit., 1847, p. 601), Schleiden (Pharmacogn. 1857, ii., 338), Clamor Marquart (Lehrb. d. Pharmacie, 1865, i., 385), and others. But Jobst's statement was corroborated by Pereira (Elem. of Mat. Med., 3d Amer. edit., 1854, ii., 219), with this qualification, that Spanish saffron constitutes the best saffron of the shops, and that French saffron is usually considered in commerce to be of second quality. This, very likely, is the origin of the high esteem in which Spanish saffron has been generally held in American commerce and by most American writers.

The adulterations of commercial saffron may be divided into two classes, namely, such which are derived from the same plant, and such coming from other sources. The most common of the first class consists of styles, the presence of which has been observed in *all* commercial samples of Spanish saffron which have been examined by me on the present occasion, as well as formerly; the variations consisting merely in the relative proportion of these yellow threads. Next in order of importance are crocus stamens, which more than fifty years ago were remarked by Martius ("Pharmacognosie," p. 220), dyed so as to resemble the stigmas in color. The same adulteration was subsequently noticed by Bentley ("Phar. Jour. and Trans.," March, 1866; "Amer. Jour. Phar.," 1866, p. 225), and minutely described by him, with illustrations. Two years previous ("Jour. de Phar.," June, 1864), Guibourt perceived a similar adulteration in a specimen of French saffron, the dyed stamens, however, being those of *Crocus vernus*, All., the anthers of which are cylindrical and rounded at the apex, while those of *Crocus autumnalis* are arrow-shaped. In the samples examined by me the latter alone were found; in some cases they still had their natural yellow color, in other cases they were dyed.

Bentley was the first one who observed also the presence of corona tubes attached to the stamens of the saffron flower, and described them in the paper referred to. This adulteration seems to have attracted little attention, but it is evidently very extensively practiced at the present time, as will be seen from the samples under examination, one-half of which are thus adulterated. When first noticed by me, and before it had been placed under the microscope, it was supposed to consist of meat fibres, which Duncan, Thomson, J. A. Paris ("Pharmacologia," 2d American edition, 1823, p. 123), Fée, F. V. Mèrat and A. J. De Lens ("Dict. de Mat. Méd.," 1830, ii., 468), P. L. Geiger ("Handb. d. Phar.," 1830, ii., 355; "Pharmac. Univ.," 1835, i., 55), J. F. Royle ("Mat. Med.," Amer. edit., 1847, 601), and others had enumerated among the adulterations of saffron. Some of the more recent German writers have repeated this statement; others merely give directions for the detection of such an admixture; and many, like all the recent French authors consulted by me, omit to mention it, doubtless because it has never been observed by them. Neither has it been seen by Pereira, for he, like Duncan, remarks (*loc. cit.*) that fibres of smoked beef *are said* to have been used for adulterating saffron; and J. R. Coxe ("Amer. Disp.," 1st edit., 1800) followed Duncan, using precisely the same language.

Some American writers are silent on this subject for the reason just stated; and I may add that various English, French and German journals of the present century have been searched in vain for a report on an authenticated case of such a sophistication; still it is mentioned by some American writers, apparently upon the authority of the early authors quoted before. Geiger ("Handbuch") describes these supposed fibres of smoked meat (ham) as being of uniform thickness, odorless, of little taste and not coloring the saliva, or, if dyed, imparting to it a slight yellow color. This description applies equally well to the corolla tubes. It should be stated, however, that, according to Bentley and Trimen, the admixture of fibres of shredded beef is a common adulterant in Italy. The best means for detecting this adulteration is, without doubt, the microscope, which reveals the transverse striæ of meat fibres. The odor of burning meat differs materially from that of burning vegetable matter, and has been recommended as the principal test by most authors, even as late as 1865 by Marquart; but on experimenting with a few shreds only, it may be misleading; it certainly should be regarded merely as a preliminary test, and the most reliable one, the microscope, is very properly insisted upon by careful modern writers.

The corolla tubes observed by me were dyed in one case by red saunders, in others with Brazil wood. The frequency of this adulteration and its close resemblance to saffron suggested the probability of its having been overlooked in samples examined before; but those saffrons—many of them adulterated—which I had procured between 1866 and 1876 were entirely free from the tubes; it is possible that this sophistication is only occasionally used, or merely for certain cheap grades.

The petals of pomegranate, cut and twisted, were mentioned by Fée, Geiger, and by Dulk, and since their time by others, as being used for adulterating saffron, for which their crimson, and after drying brownish-purple color render them fit to a certain extent; but they contain tannin, giving with ferric salt a blue-black color, which was in no case observed with the corolla shreds taken from the samples under consideration. The petals of *Saponaria*, mentioned by some authors as adulterants, are white, and to be used as an admixture to saffron, must, therefore, be dyed; seen under the microscope, they are nearly opaque, or merely translucent, while the corolla shreds—dyed and undyed—noticed by me were almost transparent, and their delicate structure was observed to be identical with shreds still attached to some of the filaments of crocus stamens, so that there can be no doubt of their origin.

From the above it would seem as if for some commercial grades of saffron the entire crocus flower was utilized, though not in the condition suggested by Monthus, in 1867 ("Jour. Phar. Chim.," 4th ser., vi., 54), who recommended to simply dry the flowers, which he regarded as possessing the same medicinal properties as the stigma; he also states that acids color the flowers red, and ammonia green. Applied to calendula florets, acids render the yellow color lighter, but ammonia darkens it. For the inferior grades of saffron the corolla tube is cut into pieces usually about 20 mm. (⅘ in.) long, the stamens are pulled off, and the corolla lobes are torn into shreds; these different parts are then dyed, somewhat rolled and twisted, and mixed with true saffron in sufficient quantity to suit the cupidity of the manufacturer, and the price offered by the dealer.

Several of the substances used for adulterating saffron, and not derived from the saffron plant, have been mentioned above; in addition to these, a long array of vegetable substances are enumerated by different authors, and it is obvious that any material may be used which is thread-like or slightly clavate, or may readily be twisted into such a shape, and in addition to this possesses sufficient flexibility, and may be dyed in close imitation of the natural color of saffron. It would, therefore, seem to be superfluous to mention any of these substances, since with the aid of the microscope—in most cases even to the naked eye, after a sample has been soaked in water—their different shape is at once revealed. The most important of these sophistications, besides those of mineral origin, consist of florets of composite flowers, more particularly of carthamus, which has been described above, and of the ligulate ray florets of *Calendula officinalis*, Lin. The latter attain a length of 20 or 25 mm. (¾ to 1 inch), and consist of a short tube and a long strap-shaped limb, 2 or 3 mm. ($\frac{1}{12}$ or $\frac{1}{8}$ inch) wide, terminated at the apex by three teeth, and marked by four delicate longitudinal veins, of which two are marginal, and beneath the teeth united with the two central veins. The limb is smooth, but the outside of the tube is covered with rather long, very thin-walled, colorless hairs, which in the dried condition are more or less twisted and collapsed, so as to present a somewhat moniliform appearance. If not dyed, these florets, on account of their yellow color, can be used for the adulteration of saffron only to a limited extent, perhaps not exceeding about 2 per cent. in weight, and may then readily be taken as portions of crocus styles. However, the dyed florets are more largely used, and, though many red coloring matters may answer for the purpose, the principal ones employed appear to be either red saunders or Brazil wood, both of which will impart a color similar to that of saffron. If dyed with red saunders, the coloring matter will not be taken up by water, but will dissolve in alcohol with a red, and in ammonia with a purple-red color. If dyed with Brazil wood, the infusion in water will be tinged red in a few seconds, the color becoming paler on the addition of an acid, and deeper red on the addition of ammonia; but the infusion is not blackened by salts of iron. A few fragments of a red wood, found in two or three of the samples of saffron, showed the same behavior; and, by microscopic examination and comparison with Brazil wood, were proved to be identical with the latter. In order to make the dyed calendula florets more closely resemble true saffron, they are rolled or twisted in such a manner as to assume an approximately cylindrical shape. In several of the samples examined a number of elongated bodies, curved near one end, and there divided into several nearly cylindrical parts, were observed, bearing some resemblance to the stamens of papilionaceous flowers, deprived of the anthers. But the hairs described before at once revealed their true nature, and, after soaking these bodies in water, they could be separated into from 6 to 12 calendula florets, which, during the manipulation of rendering them saffron-like, had been twisted together by the strap-shaped portion of the petals, while the tubular parts remained distinct. It is very likely that the ray florets of *Calendula ar-*

vensis, Lin., as stated by Guibourt ("Jour. Phar. Chim.," May, 1841, p. 315), are used in precisely the same manner. The marigold of our gardens is very frequently this species, which is distinguished from *Calendula officinalis*, Lin., by the more lanceolate stem leaves, the pale yellow and usually shorter ray florets, and the erect (instead of incurved) akenes of the *outer* row; the tubular portion is beset with the same kind of hairs.

Logwood could not be detected in any one of the samples examined; the crocus tubes, in most cases, also the corolla shreds, and frequently the stamens, were dyed with either red saunders or Brazil wood. The stamens were also generally rolled in such a manner that the anthers were not readily recognized until after immersion in water, when they expanded and revealed their valves, the cells of which, near the margin, are somewhat irregularly quadrangular, and gradually change towards the connective to a transversely elongated form.

Several of the early writers on saffron mention sand and pieces of lead as mineral adulterants. The first account of a mineral salt, lead carbonate, being used for this purpose, I have found in the dictionaries of Chevallier, Richard, and Guillemin (1829), and of Mérat and De Lens (1830); subsequently it is rarely mentioned. The use of chalk in this connection appears to have been first noted by Heræus, but was not reported to a scientific journal until 1870, though published in the "Gazette de Marseille" in the fall of 1860. The same adulteration was reported in 1869, in France, by Blacher, and in 1870, in Switzerland, by Rehsteiner, in England by Hanbury, and in the United States by me. Gypsum was also observed as an adulrerationin the year 1869 ("N. Jahrb. Phar.," xxxii., xxxiii.), and since that time both calcium salts, occasionally also the corresponding barium salts, have been invariably found as fraudulent admixtures in certain grades of Alicante saffron, rendered somewhat adhesive by means of honey, glucose, or glycerin, which substances, owing to their hygroscopic nature, have the additional advantage of preventing the saffron from getting too dry.

Adulterations with exhausted saffron were practiced at an early day, and are mentioned, in 1718, by John Quincy ("Pharmacopœia officinalis et extemporanea," p. 164), and in 1733, by James Alleyne ("Engl. Dispens.," p. 36).

The conclusion that may be drawn from these facts and statements is that saffron, in common with every medicinal article, should be carefully examined by the purchaser for all possible admixtures: for unceasing vigilance is the best, if not the only, guarantee for the purity of drugs.

MINUTES

OF THE

THIRTY-THIRD ANNUAL MEETING.

MINUTES OF THE FIRST SESSION—TUESDAY AFTERNOON, SEPTEMBER 8TH.

The American Pharmaceutical Association held its annual meeting in Lafayette Hall, in the City of Pittsburgh, Pa., commencing September 8, 1885. At 10 minutes past 3 o'clock, President Ingalls called the meeting to order. The Local Secretary, Mr. George A. Kelly, introduced the Vice-President of the Pittsburgh Chamber of Commerce, Mr. George H. Anderson, who addressed the meeting as follows:

LADIES AND GENTLEMEN:—I am proud that you have given us so much honor by asking me to welcome you on behalf of the City of Pittsburgh. You are certainly heartily welcome here. I am charged with a message from the Chamber of Commerce, and with your permission I shall proceed to read the message:

" *Chamber of Commerce, Pittsburgh, September 7th.*

" *Gentlemen:* At a meeting of the Board of Directors of the Chamber of Commerce of Pittsburgh, the following was presented and decided, and passed unanimously:

" *Whereas,* The American Pharmaceutical Association is about to meet in this city to-morrow (Tuesday), and continue in session for several days; therefore,

"*Resolved,* that we extend to the Association a hearty welcome, and tender to them the use of the rooms of the Chamber of Commerce for the transaction of any business connected with the meetings of the Association for which they may find it convenient to use them. Also

"*Resolved,* That President Dravo and George A. Kelly, Esq., be the committee to present the same to the Association.

" Respectfully, G. FOLLANSBEE, *Secretary.*"

I submit this for your further consideration. I desire to say very briefly, Mr. President, ladies and gentlemen, that this message from the Chamber of Commerce, representing as it does the entire business interests of the city, comes with a heartiness and unanimity very rarely expressed. We are practical men here in Pittsburgh. We feel that in the various departments of American industries and professions, there are many men without having the desirable thoroughness. Anything that tends to develop our industries, and brings them up to an excellence, is most cordially welcomed in our midst. I assume the object of this Association is something of this kind, that seeks to improve the material used in pharmacy, as well as the men who compound this material, in the various interests of life and humanity, and to raise them to the highest standard of excellence more than they ever have been before. This certainly is one of the most important objects that could engage men to come together to consider. I think that we all feel that in this country we are not sufficiently thorough in most things. Our mechanics are, many of them, well trained, and while we have the most skillful and ingenious men in the world, they do not understand the business of apprenticeship. A boy will learn the casual use of tools, and set up for a journeyman. In our professions it is apparently the same. In your own profession serious results have followed from the want of perfect fitness. We take knowledge, sir, that one of the objects of this society is to bring up the profession you represent to a higher standard of excellence than it has ever attained before; with this view we give you a hearty welcome to the Chamber of Commerce, and I must say that I feel an embarrassment, not in welcoming you to the city of Pittsburgh, for I feel in my own heart that this is accorded by all our places of business, but on account of the absence of the elegant gentleman who was selected to perform this duty, and who would have done it so gracefully. I want to say to you, one and all, that the citizens of Pittsburgh extend to you a kindly greeting, and welcome to you all. We are proud of this smoky city of ours, and I would like to whisper in your ears that Providence, in its extraordinary prodigality towards the industries of the city, has helped us to an element which will probably enable us to dispense with the dirty part of our city altogether. It is almost the wonder of the world that nature is producing fuel ready made to our use, better than that before used in the industries, and without any cost: it comes out of the ground. I allude to natural gas; it will create a revolution in all the branches of manufacture in this already marvelous age! Take the enormous amount of coal which is sent to the southwest and west to be used for heating, while in Pittsburgh all we have to do is to turn a faucet, and we have the means of running our steel works, our glass works, etc., and when you meet with us in the future, we hope to present you a clean city on the outside as well as on the inside. We have many objects to show to you which will be of interest to you before you leave our city. In conclusion, Mr. President, I will say that I had no speech prepared; and I again assure you, that the citizens of Pittsburgh give you a hearty welcome, and will do anything in their power to conduce to your happiness during your stay with us, and I wish you most eminent success in your deliberations.

PRESIDENT INGALLS.—Personally and on behalf of the Association which I have the honor to represent, accept my thanks for your very cordial welcome. We feel that we are in the house of our friends, and though many of us have never visited your city before, still as pharmacists we have had intimate relations with your manufacturers. I presume there is not a pharmacist in the United States who has not upon his shelves or in his laboratory some article from the hand of the Pittsburgh artisan. Please to convey to the Chamber of Commerce and to the constituted authorities, the profound thanks of the Association. (Applause.)

The President now read his annual report, as follows:

FELLOW MEMBERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION:

We assemble to day in our thirty-third annual session, under circumstances that should awaken the liveliest emotions of gratitude. In no section of our broad land has dread pestilence appeared; propitious seasons have supplemented the faithful labors of the husbandman, and the earth has given an abundant yield. Literally, "peace and plenty reign" throughout the land.

The events of the year, as regards our Association, have been of no unusual character.

The Secretary and Treasurer have been prompt and efficient in the discharge of all duties relating to their respective offices. They and the heads of the different committees will, at the proper time, make such reports as the By-laws require.

Mr. Herman W. Atwood, of New York, who was elected at Milwaukee as Chairman of the Arrangement Committee, declined to serve, and the duty devolved upon the President of making the appointment. With the advice of gentlemen from several eastern cities, I appointed our Local Secretary, Mr. George A. Kelly, of Pittsburgh. The wisdom of the appointment has been thoroughly demonstrated by the excellent service rendered.

During the past year, I have received numerous letters and circulars from the Secretary General of the Sixth International Pharmaceutical Congress, to be held at Brussels, asking the appointment of delegates from this Association, and participation through them in the proceedings of the Congress. As the Association had made no provision for defraying the expenses of special delegates, it was necessary to find, if possible, some member who would be in Europe at the time the Congress convened. Our faithful Secretary made every effort to find a proper representative, but failed. With my concurrence he addressed the General Secretary at Brussels the following note:

> "After much correspondence with our President, Mr. John Ingalls, of Macon, Ga., it has been found impossible for the Association to secure delegates for Brussels, and such representation as had been our desire. This inability is greatly regretted by President Ingalls and all the officers of the American Pharmaceutical Association, in whose behalf I have to express the best wishes for the complete success of the deliberations of the Sixth International Congress at Brussels."

My immediate predecessor, at our last meeting, strongly recommended the abolition of the initiation fee, and offered strong arguments in favor of its abolishment. The matter failed to receive the support of the Committee to whom his recommendations were referred.

During the past year I have been urged from influential sources to bring the matter again before the Association. As I believe it to be a matter of sufficient importance to at least justify the experiment, I would respectfully ask the Association to give it such consideration as it may deserve at their hands.

The subject of pharmaceutic education is each year claiming a greater share of attention, and should perhaps be briefly discussed by me on this occasion.

That an adequate knowledge of pharmacy can be acquired by routine work in drug stores, it seems to me, no one will claim. Such a knowledge can be obtained only by careful and persistent study, and under such a course of instruction as is outlined in our Colleges of Pharmacy; and these institutions should receive, as they deserve, the warmest support at the hands of this Association. To them we are certainly indebted for the best men in the profession to day, and it is a well-known fact that the most active support of this Association comes from those who are pharmaceutic graduates. But I would not for a moment disparage home education, or a self-imposed course of instruction, for I am well aware of the fact that it is impracticable for all the young men in drug stores to avail themselves of the advantages offered by our Colleges of Pharmacy. Nor would I be understood as holding that the practical training obtained in stores is valueless. On the contrary, I know it to be improving and valuable. But it must not be relied on alone to give one a proper qualification for the intelligent and efficient discharge of the responsible duties of the pharmacist.

We must expect, at least for many years, to have a larger proportion of home taught than of college-trained clerks, but we should insist that the best training for the business is a thorough and systematic course of instruction, as is provided in our Colleges of Pharmacy.

But while we should in every way foster and encourage our Colleges of Pharmacy, we must not forget that as individuals and in our respective places of business, we can do much to elevate the standard of proficiency in our profession. We should see to it that the young men who become our apprentices, so to speak, and whom we are expected to train, receive some systematic instruction beyond the daily routine of manual labor required by their positions as clerks. The plan of appropriating a definite time or fixed number of hours each day for instruction or reading, is a good one, and should be arranged for by the clerk and his employer; and if young men are unwilling thus to endeavor to improve themselves, their services should be promptly dispensed with.

It seems to me it would be wise for us as an Association to give definite shape to this matter by appointing a committee to prepare a course of study suitable for this class of persons, and I respectfully suggest that this committee should be composed of members who are instructors in the several branches of pharmacy. An outline of this kind was presented to this Association by the late Prof. William Procter, in 1858, which, with some revision to adapt it to the present state of pharmacy, would doubtless serve our purpose. This syllabus or course of study, when adopted by the Association, should be published in a separate pamphlet or volume, in order that it may be readily obtained by those for whom it is intended.

Something has been said about securing the passage of a National Pharmacy Law, and the good effects it would produce. It seems to me that under our form of government such a law is impracticable. It would properly, I think, be regarded as in violation of the Constitution and could not be enforced.

The great defect in pharmaceutical education arises chiefly from the loose manner of receiving and employing apprentices. This subject deserves our attention. In no way, in my opinion, can the matter be remedied so effectively as through the utterances of this Association.

It is true that most of our Colleges of Pharmacy require applicants to undergo a preliminary examination upon at least the usual English branches, before admitting them to matriculation; but as already stated, a majority of those who offer as apprentices or clerks, cannot avail themselves of the advantages offered by the colleges, and many of them have no ambition to become more than ordinary salesmen. What shall be done with these? Clearly they ought to be required to show proper qualification for entering upon the work they seek to undertake. They should at least be required to pass an examination upon such studies as are usually pursued in high schools and academies. Such preparation at least is necessary to enable them to profit by the instruction which is to form the ground-work of technical education in pharmacy.

I recommend that as a step towards controlling this important matter, we adopt a by-law making it a condition of membership, and to which each member shall subscribe that *members shall, in every case of application for apprenticeship, personally examine the applicant on the elementary branches of an English education before receiving him.*

Prof. Oldberg, in an admirable article upon pharmaceutical education, speaks as follows on this subject: "Before commencing the special studies, the student of pharmacy must, in order to have reasonable assurance of success, possess a good common school education. He should be prepared to pass a thorough examination in English orthography, grammar and composition; in arithmetic he should know thoroughly the fundamental rules, common and decimal fractions, compound numbers, percentage, proportion, and involution and evolution. No one who is not able to pass a rigid examination on these subjects ought ever to attempt to learn pharmacy; for until he possesses that amount of knowledge which a successful passage through such an examination implies, he cannot master the elements of the sciences that directly and intimately govern pharmacy."

In conclusion, it will be profitable to review briefly the progress of pharmacy in this country during the last few years.

When the American Pharmaceutical Association was organized in 1852, there were only five pharmaceutical associations in the United States, four of these being Colleges of Pharmacy. At this time nearly every State in the Union has a flourishing association with many local organizations. There are also several associations in the Dominion Government, and in the various States and in Canada laws have been enacted regulating the practice of pharmacy. Of course the laws on the subject are in many cases very defective and imperfect; but the fact that they have been enacted shows an awakened interest, and gives promise of better things to come. In many cases the law allows a certificate to be issued without examination. This is wrong, and should be remedied.

My position upon the Board of Pharmaceutic Examiners for the State of Georgia has enabled me to see the many evils growing out of such laws. The mere presenting of a diploma from a chartered institution should not be sufficient to secure a certificate, unless the reputation of the institution for honest and thorough work is well established. Such practice opens the door to unworthy applicants, and is an encouragement to cheap and superficial schools.

But let us accept the spirit and motive of these laws, rather than find too much fault with the letter and form. They are evidences of growth of public sentiment upon the subject of pharmacy and its requirements, and furnish good ground for congratulation among the friends of the cause. And especially, it seems to me, is this Association to be congratulated; for to it, more than to all other influences combined, are due the gratifying results achieved, and the hopeful indications of still greater development.

On motion of Mr. Markoe, the address was directed to be referred to a committee of three, for the purpose of considering the recommendations contained therein and reporting thereon.

Mr. Hallberg moved that the reading of the roll be dispensed with. Carried.

The Local Secretary, Mr. Kelly, addressed the meeting, speaking words of welcome on behalf of the local members, and of the pharmacists and druggists of Pittsburgh and vicinity in general; he read a letter inviting the association to attend a microscopical exhibition of the Pittsburgh Microscopical Society, and gave a synopsis of the entertainments and of the visits to some of the important industrial establishments planned for the visiting members and their families. Mr. Kelly also read a letter from the Petroleum Exchange, extending the privilege of visits to the members.

The Permanent Secretary read a report showing that 30 credentials had been received in compliance with Chapter viii. Art. vi. of the By-Laws, and that to the present time, credentials from the following Associations have been received and examined:

From Colleges of Pharmacy.—California, Chicago, Cincinnati, Louisville, Maryland, Massachusetts, National (Washington, D. C.), New York, Ontario, Philadelphia, Pittsburgh, St. Louis.

From State Pharmaceutical Associations: Alabama, Connecticut, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Virginia, West Virginia, Wisconsin.

From County or City Associations: Ashtabula county, O., Chicago (Retail Druggists' Assoc.), Cleveland, O., Dauphin county, Pa., Detroit, Kings county, N. Y., Lancaster county, Pa., Lynn, Mass., New York (Drug. Assoc.), Orleans, La., Washington, D. C. (Pharm. Assoc.)

From Alumni Associations of the Colleges of Pharmacy of Chicago, Louisville, Massachusetts, Philadelphia, St. Louis, and New York.

A letter was also read from Mr. C. F. G. Meyer, President of the National Wholesale Druggists' Association, appointing Messrs. Robert Shoemaker, M. N. Kline, Moritz Eisner and G. A. Kelly a committee to attend the meeting of the American Pharmaceutical Association.

After some discussion concerning the policy of admitting delegates without credentials, a motion by Mr. Sheppard, that all properly accredited delegates be received, was carried.

On motion of Mr. W. S. Thompson, seconded and amended by Mr. Menninger, the invitations received from the Chamber of Commerce, the Petroleum Exchange, and the various industrial establishments, were received with the thanks of this Association.

Vice-Presidents John A. Dadd and C. F. Goodman had sent, the former a letter dated Milwaukee, September 5th, and the latter a telegram dated Omaha, September 8th, regretting their inability to be present, and wishing a successful meeting. Both documents were read and ordered to be filed.

On motion of Mr. Oldberg, it was resolved that the greetings of this Association be sent by cable to the British Pharmaceutical Conference, then in session in Aberdeen, Scotland.

A motion was made by Mr. Menninger, and adopted, that the members of the medical and pharmaceutical professions of Pittsburgh and vicinity be invited to attend the sessions, and that they be granted the privileges of the floor.

The President invited the Committee of the National Wholesale Druggists' Association to address the meeting.

MR. KLINE.—*Mr. President, Ladies and Gentlemen:* It has already been stated that it is customary in our Association, as in others, for the chairman of a committee or delegation to do all the work, while the other members usually enjoy the privilege of hearing what they may have to say and of seeing what they may do. In this case, however, the chairman of our delegation happens to be a gentleman whose specialty I think is that while he lays out a considerable amount of work, he gets some one else to perform it; and he has prevailed upon your humble servant, who came here without any preparation, to respond for the National Wholesale Druggists' Association. I will simply state, therefore, that the Association from which we stand accredited takes upon itself great honor in being permitted to participate in your deliberations even so far as to be occasionally heard. As you are well aware, the object of that Association is one entirely different from the Association before which we appear, and yet it would seem as though a harmony of interest and a harmony of work must result in good to both. I have seen it stated somewhere that some men act as mental derricks, lifting those who come in contact with them to a higher plane. I believe that the American Pharmaceutical Association acts in a similar manner, and that the effect of its deliberations is certainly very beneficial upon the branch which I represent, the National Wholesale Druggists' Association. From our standpoint, as wholesale druggists, we are probably in a better position to judge of the result of such work as is performed by our Colleges of Pharmacy, and by the associations similar to this one—the National Association and the State Associations—than many of you who may be engaged in the calling of a retail druggist. There was a time, as has been stated, when anything was good enough for the American market; and I believe now the opinion in Europe is, that nothing is good enough for the American market. From what, I would like to ask, can this result, other than the education which has been fostered by this Association, and which has been dealt out by the Colleges of Pharmacy, and various schools, instructing in the objects of the profession the members who have entered it? The enactment of laws in various States restricting the practice of pharmacy, is certainly a step in the right direction. But it is useless for me to go over this ground here so well known, and I will take up your time no longer, except simply to express to you our thanks on behalf of the National Wholesale Druggists' Association for the labor which you are performing, and to express further on our part the hope that the interchange of delegations from both associations may be profitable and continue as long as both associations remain in existence. (Applause.)

THE PRESIDENT.—Mr. Sheppard has very kindly consented to respond to Mr. Kline's remarks.

MR. SHEPPARD.—Gentlemen of the Wholesale Druggists' Association, it gives me great pleasure to speak to you on behalf of the American Pharmaceutical Association, and to express our feelings of pleasure that there is this mutual interchange of recognition between our two societies; and that we feel, gentlemen, that it will be for the mutual benefit of both organizations. It has never been my pleasure to have a personal knowledge of the way in which you have received our delegates, but the report that these gentlemen have always brought back, has made me wish that I had been one of them. Gentlemen, you have a grand work to do—you are doing it well, and the practical way in which you deal with the very practical questions which are annually brought before you for your consideration, deserves and receives our hearty praise. As the gentleman who has represented you has stated, the two organizations can and should work together; each one is very naturally the helper of and supplementary to the other. Let us go forward—we in our work, you in yours. You are doing much to advance and bring forward the wholesale drug trade of the country, and to place it on a basis of integrity and justice to all concerned. Our work is in another field, to advance and elevate the retail department of the trade. Our work of course naturally leads our feet into the realms of scientific research, while yours is the dealing with practical matters, and the interchange of the commodities of our craft in a fair and business-like method. We each have our own work; they are supplementary each to the other; let us go forward in a straight course. We shall succeed; for it is the law of God, that whoever tries earnestly to do right, will learn how to do right, and surely the course which we are all concerned with—the course which is marked out for each of us—is a straight line. We shall always find that there are temptations to swerve from that line, but let us recognize the fact that it is the concomitant of any organization, the same as it is the natural concomitant of our method, that every effort to do right and resist the wrong, properly makes us stronger and better men. Certainly in no department of life is this more true than in ours. On the part of our Association we bid you a hearty welcome. Come and be with us: what is ours is yours at this time. We only hope, gentlemen, you will enjoy your being with us as much as we enjoy having you as our guests.

MR. KELLY.—I hope the members will take the remarks of Mr. Kline in reference to the chairman of the committee as Pickwickian entirely. I was very much pleased with his remarks, and think that they were fully as good as I could have made myself, but his reference to the putting of all the work on other people is not correct. In connection with this, I desire to say that I received a letter from the President of the National Wholesale Druggists' Association, regretting his absence from the meeting of this Association, of which he has been a member for twenty-five years.

Reports from the following committees were presented, and for the present laid upon the table: On the Drug Market, on Papers and Queries, on Prize Essays, on Legislation, on the Report on Unofficinal Formulas, on Legislation concerning Proprietary Medicines, and from the Committee to Visit the National Wholesale Druggists' Association. In relation to the Committee on Unofficinal Formulas, whose report was received last year, the Permanent Secretary stated that it had never been discharged; hence it had again been placed on the list of committees, although a further report had not been promised or expected.

The appointment of the Nominating Committee being in order, the following delegates were selected by their delegations to serve on that committee:

COLLEGES OF PHARMACY.

California.—E. W. Runyon.
Chicago.—T. H. Patterson.
Cincinnati.—J. D. Wells.
Louisville.—Aug. Knoefel.
Maryland.—C. V. Emich.
Massachusetts.—G. F. H. Markoe.
National (Washington).—Jos. R. Walton.
New York.—G. J. Seabury.
Ontario (Toronto).—E Gregory.
Philadelphia.—Wallace Procter.
Pittsburgh.—Jas. Kerr, Jr.
St. Louis.—G. H. C. Klie.

STATE PHARMACEUTICAL ASSOCIATIONS.

Georgia.—J. Ingalls.
Illinois.—C. F. Rickey.
Indiana.—G. W. Sloan.
Iowa.—J. A. Treat.
Kansas.—R. J. Brown.
Louisiana.—A. K. Finlay.
Maryland.—H. A. Elliott.
Massachusetts.—J W. Colcord.
Michigan.—A. B. Stevens.
Minnesota.—Karl Simmon.
Mississippi.—J. W. Eckford.
Missouri.—A. F. Fleishmann.
New Hampshire.—C. A. Tufts.
New Jersey.—E. A. Sayre.
New York.—L. E. Nicot.
Ohio.—T. L. A. Greve.
Pennsylvania.—Jos. S. Evans.
Virginia.—F. H. Masi.
West Virginia.—E. Bocking.
Wisconsin.—A. H. Hollister.

LOCAL PHARMACEUTICAL ASSOCIATIONS.

Chicago.—A. E. Ebert.
Cleveland.—Jos. Feil.
Dauphin Co., Pa.—G. A. Gorgas.
Detroit.—A. W. Allen.
Kings Co., N. Y.—W. P. DeForest.
Lancaster Co., Pa.—C. A. Heinitsh,
Lynn, Mass.—J. W. Colcord.
New York Drug. Ass.—T. J. Macmahan.
Orleans, La.—A. K. Finlay.
Washington, D. C.—P. Reinlein.

ALUMNI ASSOCIATIONS.

Chicago.—J. H. Wilson.
Massachusetts.—W. W. Bartlet.
New York.—H. C. Porter.
Philadelphia.—E. C. Jones.
St. Louis.—J. M. Good.

Motions were then made by the following named members that Societies from whom credentials had not been received, should be represented in the Nominating Committee. After some opposition the motions were carried. They were as follows:

By Mr. Macmahan: Mr. T. F. Main, to act for the Connecticut Pharmaceutical Association.

By Mr. Sheppard: Mr. Robt. E. Parsons, to act for the Newark, N. J. Pharmaceutical Association.

By Mr. Sayre: Mr. G. L. Peck, to act for the Queens Co., N. Y., Pharmaceutical Association.

By Mr. Sayre: Mr. Chas. Rice, to act for the N. Y. Society of German Apothecaries.

By Mr. Sloan: Mr. Leo Eliel, to act for the St. Joseph's Co., Ind., Pharmaceutical Association.

In addition to the above, the President appointed the following members, who were not present as delegates, to serve on the Nominating Committee: G. W. Kennedy, C. W. Day, W. J. M. Gordon, H. J. Menninger, and G. W. Sloan.

Mr. Markoe moved that when we adjourn, we adjourn to meet on Wednesday morning at half-past nine o'clock, Pittsburgh time. Carried.

On motion of Mr. Menninger, it was resolved that in all adjournments, local time of Pittsburgh be understood.

Mr. Kennedy, Secretary of Council, read the Minutes of the sessions held since the last meeting of the Association, which were corrected at the request of Mr. W. S. Thompson, and then approved. Four sessions have been held, one at Milwaukee, August 29, 1884, one at Philadelphia, December 30, 1884, and two at Pittsburgh, September 7 and 8, 1885. At these sessions the following business was transacted:

SESSION AUGUST 29, 1884 (7 members present).

The following report of the Auditing Committee was adopted and the Committee discharged:

We the undersigned Auditing Committee have this day examined the books and accounts of Charles A. Tufts, Treasurer, have compared the same with the vouchers, and also have examined the stock-book of the Association, and find the same correct in every particular. We find the balance in the Treasury to be $6260.57, not including the three special funds of the Association, which we also find correct according to the statement of the Treasurer.

Respectfully submitted, A. E. EBERT,

Milwaukee, August 28, 1884. CHAS. F. GOODMAN.

The Permanent Secretary was authorized to have a suitable trunk made for carrying the documents, etc., of the Association to and from the meetings.

The recommendations for abolishing the initiation fee and for reducing the annual dues, were referred to the Finance Committee and Treasurer, to report thereon at the next session of Council.

On motion of A. E. Ebert, the salary of the Reporter on the Progress of Pharmacy for the ensuing year was fixed at $750.

SESSION DECEMBER 30, 1884 (7 members present).

The amendment to the By-laws relating to the transaction of business which is not of a scientific character, which was approved in Milwaukee (see Proceedings 1884, p. 541), was modified (*Ibid.*, page 17).

The selection of the phototype of Daniel B. Smith, the first President of the Association, for the volume of Proceedings for 1884, was made upon the recommendation of C. L. Diehl, seconded by G. W. Kennedy.

On motion of S. A. D. Sheppard, seconded by G. W. Kennedy, it was resolved, that the actual expense incurred for railroad fare by any member of Council in attending *one* regularly called meeting of the Council, held between the times of the annual meetings, be paid by the Association.

On motion of W. S. Thompson, it was resolved to recommend to the Association to strike out the last sentence of By-laws Chap. ix., Art. ii. Sec. 4, which reads: "The Secretary shall then call the roll, noting the names of the delegates and members in attendance."

The Committee on Finance presented the report of the Treasury Examining Committee of 1884, which had been referred to them (Proceedings 1884, page 488), and read a report on the various subjects referred to them for consideration.

BOSTON, *March 14th, 1884.*

Prof. Joseph P. Remington, Chairman Council American Pharmaceutical Association, Philadelphia, Pa.

Dear Sir.—The committee appointed by the Council to examine the accounts of the Treasurer of the Association reported progress to you on February 25th ult., and now beg leave to submit the following complete report.

All the books, accounts, vouchers, etc., of the Treasurer have been carefully examined, the work occupying the committee four days, as each of the nearly fifteen hundred accounts in the ledger had to be compared with the corresponding entries in the cash book, and many other examinations also made.

The Treasurer's report for the year ending December 31st, 1883, is transmitted herewith, and the committee hereby certify that the same is correct; but while so doing they would also state that certain facts have come to their knowledge during the examination which should be mentioned in this report. They are as follows:—

Some modifications in the manner of keeping the books are desirable in order to make the examination of them, in future, more easy and more satisfactory.

On this point the committee have made to the Treasurer recommendations similar to those made to him by the Finance Committee last year, viz.:—

The entries on the cash book should be more explicit.

The cash entries on the ledger should be so made as to show the transactions as they actually occurred, in order to satisfactorily compare ledger with cash book.

There should be ledger accounts opened showing the amounts of the annual assessments due for each association year, and the amounts of such assessments paid or otherwise settled during the year.

There were found numerous clerical errors, incident perhaps to the keeping of so many accounts, which added very much to the work of the committee.

The Committee also find a number of cases where parties are credited on the ledger as having paid, but which amounts do not appear on the cash book. For these entries the Committee have accepted the statement of the Treasurer, that they were probably credited to the wrong members, and would be righted in course of time by notifications from the persons who had paid, and then on receipt of such notices the Treasurer would correct the accounts.

The Committee find that Mr. Willis Benedict, of New Haven, was elected a member of the Association September 13, 1882, and paid seventeen dollars and a half ($17.50) (membership $5.00, assessment for 1882, $5.00, parchment certificate $7.50), which amount has not yet been paid into the treasury, but is said to be in the hands of an agent of the Association. The Treasurer has received from Mr. Benedict the amount of his assessment for 1883.

The Treasurer's books show a cash balance, January 1, 1884, of $5509.92.

The Committee find deposited in the New England Trust Company of Boston, January 1, 1884, the sum of $5081.49. Cash in the Treasurer's hands at same date $428.43. The Treasurer's health at this time was very poor, frequently unfitting him for any attention to business, hence the cash balance in his hands instead of on deposit.

The Committee also report that the Treasurer states that his receipts since January 1st, to March 12th, have been $505.00, and his expenditures during the same period $55.00, and they find cash on deposit in the New England Trust Company, March 12, 1884, $5959.92, being total amount of cash as shown by the Treasurer's books and statement.

The books present an exceedingly neat and attractive appearance, and show that the Treasurer must have expended on them a great amount of care and personal labor. The work of so keeping these books, in connection with the regular daily routine duties of a pharmacist, must be very great indeed, and the Treasurer most heartily deserves the thanks of the Association for his efforts.

In closing this report, the Committee make the following recommendations, viz:

That the Association year be so changed as to end June 30th, instead of December 31st, as it now does.

The Association year formerly ended September 1st.

In 1879 (see Proceedings), it was changed so as to correspond with the calendar year.

The change was an improvement on the old plan, but the undersigned are led to believe from their experience with the accounts, etc., of the Association Treasury, that the change they propose, viz: July 1st to July 1st, would be an improvement on the plan adopted in 1879.

Their reasons are as follows:

(1) The accounts of the Association are so extended that no committee can properly examine them in any short period of time, and the time at the disposal of an Auditing Committee at the annual meeting is so limited that no proper report can be made by them on the work of the Treasurer for a period of eight months—viz, January 1st to September 1st.

(2) If the proposed recommendation should be carried into effect, the regular annual Examining Committee would make their report to July 1st, and the Auditing Committee at the annual meeting would be able to carefully examine the accounts, etc., from July 1st to September 1st—a period of but two months instead of eight months, as at present.

(3) There would also then be no need for the Treasurer to present at the annual meeting two elaborate statements or reports, as he does at present—the one his annual report for the Association year, January to January, and the second a supplementary report for the period from January 1st to September 1st. It will be seen that under the present plan the period from January 1st to September 1st is reported on twice over —first in the supplementary report, and then in the annual report for the next year. It would seem that these two statements, as now presented, must be somewhat confusing to many of the members of the Association.

(4) Under the proposed plan, a person's first year as a member of the American Pharmaceutical Association would contain ten months, instead of four, as at present.

Signed,
S. A. D. SHEPPARD,
HENRY CANNING,
LINUS D. DRURY,
Examining Committee.

To THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Gentlemen: Your Committee on Finance respectfully present the following report:

The following items of business have been referred to us by the Council:

First. The report of the Examining Committee of date March 14, 1884.

Second. The recommendation of the President, that the initiation fee be abolished.

Third. The recommendation that the annual dues be reduced.

On the first, your Committee recommend that the report of the Examining Committee be approved, and that the recommendations contained therein be adopted. On the second and third items your Committee recommend that the initiation fee and annual dues remain as they are.

Their reasons for the latter recommendation are these: The initiation fee and annual dues as at present fixed are not a burden to the individual members of the Association, nor do they prevent a healthy increase of our membership from that class of pharmacists whom it is desirable to have as members; nor do your Committee know that there is any general complaint regarding the same.

It is true that our financial condition appears at present to be good, but the Association is not rich; and it has been only by careful management in the past few years, and by reducing the expense of publishing the volume of the annual Proceedings, that we have reached the place we now are. By referring to the Proceedings of 1877, page 526, it will be seen that it is not many years since the Association was sadly in need of money; in fact, almost insolvent. And when carefully examined, the Treasurer's annual report will not show so large a cash balance as at first glance it appears to do; for the expense of the year's Proceedings has to be paid shortly after the annual meeting. The several funds that are in the care of the Association should not be considered as the absolute property of the Association. Again, it is very desirable that an organization like the American Pharmaceutical Association should have a reasonably large fund on which it may be able to draw for such purposes as it may deem proper. Such a fund gives stability and permanence to a Society, and many times affords the means for relieving it from embarrassing situations. Such a fund is also a means of attracting and holding good members, and thus would serve as a means of helpfulness in our work. We would suggest that such a fund may in the future help to relieve the Association in the somewhat puzzling matter of the annual entertainments. Your Committee might go on and multiply reasons for their recommendation, but they deem the above sufficient, and will only add, in this connection, that it is the sentiment of the Committee that our expenses should be limited in every proper way, and that it should be the aim of the Association to accumulate (outside of those held in trust by the Association) a fund of at least twenty-five thousand dollars.

Your Committee further recommend that the Chairman of the Council, and not the Treasurer, present the annual report of the various funds held by the Association. The Chairman of the Council is the custodian of the funds, and therefore the proper person to make the report. Furthermore, this proposed arrangement, by separating the account of the various funds from the cash balance in the Treasurer's hands, would have the advantage of presenting our financial status more nearly in its true light to the members of the Association, the most of whom can hardly be expected to give such close thought to this matter, but are more likely to form their opinion by a cursory glance at the sum total of the figures at the bottom of the Treasurer's report. Your Committee feel that as is the case with an individual, so there is danger to an association when its financial strength is over-estimated.

Signed,
S. A. D. SHEPPARD,
JOS. L. LEMBERGER,
HENRY CANNING,
Finance Committee.

The various suggestions and recommendations contained in the two reports were severally discussed and approved.

The General Rules on Finance (see Proceedings 1883, p. 420), in order to adapt them to the change in the close of the fiscal year to June 30th, were modified as follows: In Rule 7, *July* was substituted for "January," *fifteenth day of July* for "first day February;" in Rule 7, *July* for "February;" and in Rule 10, *July* for "February," and *first day of August* for "first day of March."

The Secretary of Council was instructed to communicate with the Treasurer concerning the initiation fee of Mr. Willis Benedict, of New Haven, Conn.

The report of the Finance Committee was then adopted as a whole.

Mr. Thompson reported that the claim of Timothy Costello (Proceedings 1884, p. 501) had been settled.

Mr. S. J. Bendiner, on behalf of the Committee on Report on Unofficinal Formulas, submitted a proposition that the Association, through its Council, become one-fourth part owner of the copyright of the forthcoming edition of the New York and Brooklyn Formulary, and that, if desirable, all subsequent editions be under the control of the Association.

On motion of W. S. Thompson, seconded by J. L. Lemberger, thanks were tendered to the three Societies for their liberal offer, which, under the by-laws, cannot be accepted by Council; the offer, it was suggested, should be presented to the next meeting of the Association at Pittsburgh.

Mr. Ebert moved, seconded by Mr. Goodman, that a committee be annually appointed to be known as the "Committee on Materia Medica," or "Pharmacognosy," to consist of five members, whose duty it shall be to investigate and report annually on the origin, sources, and value of new remedies, such as are brought to the notice of the medical and pharmacal professions of this country, the committee to represent the different sections of the country.

The chair ruled the motion out of order, the subject being of a scientific character.

On motion of Mr. Lemberger, it was referred to the Association.

The chair appointed Messrs. S. A. D. Sheppard, Henry Canning, and L. D. Drury, of Boston, a committee to examine the Treasurer's account.

The subject of a permanent inexpensive badge (see Proceedings 1883, p. 472) for the members being introduced, the Permanent Secretary stated that the cost of the die and badges made in 1876 (Proceedings 1876, p. 583) had been paid back into the treasury, and that the remaining badges could now be sold at 25 cents each.

A motion by Mr. Kennedy to sell the badges at the price named, was adopted.

On motion of Mr. Thompson, seconded by Mr. Lemberger, the usual number of circulars to non-members, with blank applications, were ordered to be issued by the Secretary of Council, the expense not to exceed $125.

SESSION SEPTEMBER 7, 1885 (9 members present.)

The Permanent Secretary suggested the discontinuance of publishing hereafter the list of deceased members, which, on motion of Mr. Menninger, was referred to the Committee on Publication with power to act.

A proposition from the proprietors of "The Chemist and Druggist," London, England, to furnish all the members of the American Pharmaceutical Association regularly with copies of that monthly journal, and of the annual diary, at the nominal annual cost of $1.25 for each member, payable by the Association, was considered; and on motion of Mr. Menninger, the Permanent Secretary was instructed to reply to this proposition, that such subscription is foreign to the objects of the Association, and that the proposition cannot be entertained by the Council.

Mr. Ebert suggested the feasibility of the publication by the Association of a journal. Such a plan was opposed by the Permanent Secretary, who, however, considered it practicable that arrangements be made for periodically issuing the Transactions of the Association. It was then, on motion of Mr. Ebert, seconded by Mr. Menninger, resolved that the Committee on Publication be instructed to consider and report to Council upon the propriety of establishing a periodical publication under the auspices of the American Pharmaceutical Association.

SESSION SEPTEMBER 8th, 1885 (10 members present).

The applications of 22 candidates for membership were examined and referred to the Association.

The report of the Committee on Publication was read and adopted.

After a lengthy discussion on the propriety of discontinuing the annual exhibitions under the auspices of the Association, a motion by Mr. Ebert prevailed, slightly modified by the Permanent Secretary, that the Council recommend to the Association that Chapter ix. Article v. of the By-laws be expunged, and that all references relating to exhibits be stricken from the By laws.

The Permanent Secretary's report on credentials was examined and accepted.

The Treasurer's report was read and referred to an Auditing Committee, consisting of S. A. D. Sheppard and W. J. M. Gordon.

On motion of A. E. Ebert, the Council resolved to recommend to the Association that the Treasurer's salary be fixed at $750.

On motion of A. E. Ebert, the Permanent Secretary and Chairman of the Finance Committee were instructed to draft a letter to be sent to non paying old life members, asking them to relinquish their claim of the annual Proceedings, or to pay for the same at the rate of $5 per year.

Mr. Diehl moved that the restrictions in reference to furnishing copies of papers read before the Association to the representatives of the various journals shall apply to the reports of officers and committees. Adopted.

The Chairman of Council reported the following bonds, etc., belonging to the Association to be in his possession.

Ebert Fund. Five bonds 4 per cent. Government Consols, numbered 127,868, 127,869, 127,870, 127,871, and 138,629; $100 each—$500.

Life Membership Fund. Eleven bonds, 4 per cent. Consols, numbered 127,872, 127,873, 136,787, 136,788, 136,789, 137,237, 144,046, 150,258, 150,259, 150,260 and 153,400.

Centennial Fund. Two bonds, 4 per cent. Consols, numbered 57,983 and 61,202.

Balances in Saving Fund: *Ebert Fund*, $116.45; *Life Membership Fund*, $80.65, and *Centennial Fund*, $133.16. Total in Saving Fund, $330.26.

The Committee to examine the accounts and books of the Treasurer presented the following report, which was accepted:

BOSTON, *August* 24, 1885.

PROF. JOSEPH P. REMINGTON, CHAIRMAN OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Dear Sir: The following is the report of the Examining Committee for the present year:

The Committee met August 17th, and proceeded to carefully examine the books and accounts of the Treasurer. The work occupied a little more than three days.

The experience gained by previous examinations was of great assistance to the Committee, else they could not have completed the work so soon, as they had to examine for eighteen months instead of twelve months, as in former years.

The books and accounts presented the usual neat and attractive appearance. The suggestions made to the Treasurer last year by the Committee as to the change in the manner of making entries on the ledger had been followed by him, and the work of comparing the cash book with the ledger was more satisfactory than it could possibly be before. The Committee found some errors, and having called the attention of the Treasurer to same, he promptly rectified them.

The Ebert Centennial and Life Membership Funds were examined and found to be correct.

The cash on deposit at the New England Trust Company, Boston, as shown by the deposit book this day, corresponds with the amount as shown by the Treasurer's books.

The following names were found on the ledger that do not appear on the printed lists in the Proceedings of 1884:

James Van Deventer Coon (L. P., 109), Olean, N. Y. 1880.
Robert Wilson Crawford (L. P., 112), Fort Dodge, Iowa. 1881.
Philip H. Franklin (L. P., 173), Marshall, Missouri. 1881.
George Riley James (L. P., 241), Schoolcraft, Michigan. 1869.

The name of Frederick H. Chapin (L. P., 106), Hartford, Conn., does not appear on the alphabetical list in the Proceedings of 1884.

From the condition of their accounts, it would seem that Mr. John H. Parker, of New York (L. P., 397), and Mr. Addison S. Lee, of Raleigh, N. C. (L. P., 316), should be reinstated.

The Committee find a clerical error in the Treasurer's report, as submitted September, 1884 (see Proceedings 1884, page 525). The item in the list of "Disbursements," reading, "George W. Kennedy, salary as Secretary of the Council from September, 1883, to September, 1884," should have read as follows: Geo. W. Kennedy, salary as Secretary of the Council from September, 1882, to September, 1883, $25; and as chairman of the Committee on Membership from September 1882, to September, 1883, $175. The account of Mr. Theodore Ronnefeld, of Detroit, appears on the ledger (p. 427), to be somewhat complicated. The Treasurer states that his understanding of it is that the balance appearing to be due by Mr. Ronnefeld some years ago was paid by him to Mr. William Johnson, of Detroit, and that the Association has not received the same from said Johnson. Signed,

S. A. D. Sheppard,
Henry Canning,
Linus D. Drury,
Examining Committee.

The following report was read:

Pittsburgh, Pa., *September* 7, 1885.

To the Council of the American Pharmaceutical Association.

Gentlemen: The following is the report of your Committee on Finance:

The year just closed has not been a favorable one financially.

With a cash balance of $6260.57 in the treasury in August, 1884, we have on hand at the close of the Association year, as shown by the Treasurer's report, but $4278.79—a decrease of nearly two thousand dollars.

The following are the amounts of the cash balances, as shown by the Treasurer's reports, commencing 1880:

1880	$1561 61
1881	1627 06
1882	1981 10
1883	4196 58
1884	6260 57
1885	4278 79

By these figures it will be seen that we have lost in the last year just about what we gained in the year previous.

The loss is to be accounted for as follows:

1st. The small number of new members received at the meeting in Milwaukee.

The following are the number of new members received at the annual meetings, commencing in 1880:

1880	176
1881	147
1882	128
1883	90
1884	40

2d. The expenses attendant upon the meeting at Milwaukee were very large, $557.72, in addition to the increased travelling expenses of the Secretary and Treasurer, on account of the distant locality of the meeting.

3d. The cost of publishing the Index in the Proceedings for 1884—$687.00.

4th. The amount paid from the Treasury into the Life Membership Fund, viz: $316.00.

5th. On account of the Association year now closing July 1st, and the yearly accounts being made up to that date, there is an apparent decrease in the income from membership fees by the amount usually paid in after July 1st, and previous to the compilation of the Treasurer's report.

6th. There have also been some other small items which have increased the amount of our annual expenditures.

Attention may here very properly be called to the large amount now paid out by the Association for salaries, as compared with the amount paid ten years ago.

In 1875, it was	$1400 00
In 1885, it was	2200 00
The coming year it will probably be	2300 00

Besides this there are additional expenses of Council and Committees.

It will be seen by the Treasurer's Report that there is now due the Association for membership fees, including those for 1885, a *very* large sum, viz, $9000.00.

It is very desirable that the members should pay up more promptly.

There are on the ledger the names of 73 members who have not relinquished their rights under the old life-membership system, and who are a burden to the Association, from the fact that they receive the Proceedings free of charge each year.

This matter has frequently received the attention of the Association in years past, yet it seems important enough to bring forward once more.

Can we not in some way get at least a partial relief from this incubus?

There are on the ledger the names of 1284 active members. They are divided as follows:

Paying members	1194
Life members, new system	17
Life members, old system	73
	1284

It may be interesting to note the cost of publishing our Proceedings of late years. The following are the amounts as reported by the Treasurer each year, commencing 1878, after deducting from each the salary of the Reporter on the Progress of Pharmacy, and the expense of the index as found in the reports for 1884 and 1885:

1878	$2439 46
1879	2258 33
1880	2034 26
1881	2064 38
1882	2447 72
1883	1548 66
1884	1745 95

It will be seen that the figures were lowest last year (1883), and that we are now on the ascending scale. The Committee feel that they cannot express too strongly the opinion that the work of the Examining Committee is one of great importance, and it is a matter for congratulation that it has been made a permanent feature in the work of the Association.

The work of properly auditing such a set of books as ours, cannot possibly be done without the expenditure of so much time and labor as cannot be at the disposal of an auditing committee at one of the annual meetings of the Association. To show in a slight degree the importance of this position, and not in any way to criticise the Auditing Committee of 1884, we will state that the Examining Committee of this year found at least nine errors in the accounts from January to September, 1884, that had escaped the observation of the Auditing Committee, simply because the Auditing Committee did not have time enough to do their work.

The plan inaugurated this year of closing the accounts July 1st, promises to greatly facilitate the work of properly examining and auditing.

The experience of the present year has been eminently satisfactory, and each year will make the work easier.

We would recommend that the Permanent Secretary be requested to have struck off each year, when the Proceedings are printed, five extra copies of the Alphabetical List of Members, for the use of the Examining Committee, such extra lists to be on paper that will have broad margins, suitable for making notes thereon.

We would also recommend that the General Rules of Finance be printed, for the information of members and for the guidance of the Treasurer and of the several committees, in the Proceedings each year.

The report of the Chairman of the Council will give an account in detail of the Ebert Fund, the Centennial Fund, and the Life Membership Fund.

We are pleased to notice that there has been a total increase in the value of the Funds since last year of $592.33.

The Treasurer having now more than a sufficient amount ($133.16) accumulated from the interest on the Centennial Fund, will, as is his duty, purchase a 100 dollar registered United States bond, taking the amount necessary for such purchase from the savings bank in which it is deposited.

We recommend the following amendments to the By-Laws of the Council :

Add to Article I., Chapter III., the following: He shall receive an annual salary of $50.00.

Add to Chapter IV., the following: Article IV. The Chairman shall receive an annual salary of $150.00.

In making this recommendation, your Committee are not recommending an additional expenditure, but offer the proposition simply for the purpose of making more explicit and clear in the future the action of the Council in paying out said sums in accordance with the vote of the Association at the meeting at Niagara Falls (see Proceedings 1882, pp. 642, 643 and 646).

In closing, your Committee feel that they cannot too forcibly urge upon the Association the importance of a policy of economy of administration in every department, for although there is now a balance in the Treasury, we all know it is very easy to spend money; and it is the opinion of your Committee, as expressed in their report of December 30, 1884, that as is the case with an individual, so there is danger to an association, when its financial strength is over-estimated.

S. A. D. SHEPPARD,
JOS. L. LEMBERGER,
HENRY CANNING,
Committee on Finance.

The recommendations of the Finance Committee, in relation to the extra copies of the alphabetical list of members, and to the printing of the Rules of Finance in the Proceedings, were adopted; and those relating to fixing the salaries of the Secretary of Council and of the Chairman of the Committee on Membership, were laid over under the rules to a subsequent session.

Pending the approval of the Minutes of Council, it was stated that a number of the old-style members continued to pay their annual dues, and that the saving of some copies of the Proceedings involved but a small amount. On the other hand, it was stated that several old-style life members, at their own request, were not furnished with the Proceedings, although their names remained on the roll, and that it was believed others had no use and did not care for the Proceedings, or would cheerfully pay for the same if their attention was drawn to the matter.

A motion was made by Mr. Bedford to adjourn, but was afterwards withdrawn, when the reports of the Committee on Membership, on Publication, and on Prize Essays, were read, as follows:

REPORT OF THE COMMITTEE ON MEMBERSHIP.

To the Chairman and Members of the Council of the American Pharmaceutical Association.

Gentlemen: Your committee, through its chairman, would respectfully submit their report.

Members in good standing at last report		1377
Members elected at last meeting		40
Restored to rolls by action of Council		3
Making a total membership of		1,420
Loss by resignation	7	
Dropped from the roll for various causes	67	
Loss by death	22	
Total loss		96
Number in good standing at this report		1,324
Honorary membership at last report	29	
Loss by death	2	
Balance at this date		27

In accordance with resolution passed by Council at the meeting in Philadelphia, December 30, 1884, your committee sent out 5,000 circulars and blank applications to pharmacists residing in the States of Indiana, Ohio, West Virginia, Maryland, and Pennsylvania, which caused an expense to the Association as follows:

Printing circulars, applications, and envelopes	$48 00
Postage	50 00
Addresses and telegrams	9 54
Total expense	$107 54

The circulars were similar to those of last year, with some slight modifications, and the addition of the programme of the thirty third annual meeting, in compliance with a resolution adopted by the Association last year.

A number of applications have thus far been received, properly filled out, vouched for, and accompanied with the requisite fee, which will be reported at the proper time for election.

At this date a number of members are liable to be dropped from the rolls of the Association for non-payment of dues, but it is to be hoped that many of these will pay up their arrearages before the next volume of the Proceedings is published.

The reaper Death has again been busy in the ranks of our Association. During the year your Committee was notified of the decease of the following members, and the sad office of tendering a brief tribute to the departed becomes ours; several of these names appeared among the list of deceased members published in last Proceedings:

Francis Raas, Brooklyn, N. Y.; Augustus W. Hottendorf, Cincinnati, Ohio; Adolphus Fennel, Cincinnati, Ohio; Walter F. Phillips, Portland, Maine; Orlando Tompkins, Boston, Mass.; John Frey, New York City; Wm. A. Gellatly, New York City; Wm. H. Crawford, St. Louis, Mo.; Thomas J. Covell, Rock Island, Ill.; Emil Albrecht, Tamaqua, Pa; Ferdinand Hassencamp, Baltimore, Md.; Samuel E. Tyson, Georgetown, D. C.; Wm. F. Scala, Washington, D. C.; John W. Sheddon, New York City; Joseph R. Bond, New York City; Graham Wilder, Louisville, Ky.; Ludwig Heller, Chicago, Ill.; Moses Oberdeener, Santa Clara, Cal.; Ernest Dreher, Newark, N. J.; John P. Muth, Baltimore, Md.; A. F. Wood, New Haven, Conn.; Henry B. Parsons, New York, City; Dr. Augustus A. Delondre, Sevres, France; Dr. Xavier Landerer, Athens, Greece.

Francis Raas, of Brooklyn, N. Y., died there August 22, 1884, after a lingering siege of sickness, having been confined to his house for a long time. Deceased was born in France, and was educated as a pharmacist in his native country. Afterward he emigrated to this country, and has been engaged in his profession up to the time of his death. He carried on the retail business for fifteen years, and the wholesale for two years in Brooklyn. He was a man highly respected and esteemed for his many good qualities. He was elected a member of our Association at the meeting held in Toronto, Canada, in 1877.

Augustus W. Hottendorf, of Cincinnati, O., was the second child of Dr. August Louis Hottendorf, and was born in the Province of Hanover, Germany, on the 9th of May, 1839. He received his early education at the place of his birth, and came to Cincinnati on the 4th of July, 1854. Two years later he entered upon an apprenticeship of three years, with Ferdinand Kinzbach, and afterwards became a clerk in the drug store of Dr. Samuel Alexander, corner of Baymiller and Central Avenue. In 1863 he purchased the store from Dr. Alexander, and carried it on quite successfully for a term of sixteen years. During the last two years of his life, the deceased was more or less a sufferer from disease, so that life became a burden to him. He died on the 5th of August, 1879, of spinal atrophy, in his 41st year. Deceased became a member of our Association at the meeting held in Cincinnati, Ohio, in 1864.

Adolphus Fennel, of Cincinnati, O., died there September 29, 1884. Mr. Fennel was born in Cassel, Germany, in the year 1824, consequently was sixty years old at the time of his death. He entered the Gymnasium at Cassel, and then began the study of Pharmacy at Eschwege. Later, he returned to Cassel, and entered the Polytechnikum, graduating with high honors in physics, chemistry and mathematics. Afterward he clerked in the drug business in Stuttgart and Switzerland, and in 1851 emigrated to America, locating at Cincinnati, where in 1855 he went into business for himself. In 1871 he was elected to the chair of Chemistry, in the Cincinnati College of Pharmacy, which position he held up to the time of his death. Mr. Fennel was regarded by those best acquainted with his abilities as a man well versed in his profession, and was well thought of for his industrious habits and integrity. The deceased became a member of our Association at the meeting held in Cincinnati in 1864.

Walter Fiske Phillips was born in 1825, and was consequently 59 years of age at the time of his death, which occurred October 24, 1884. Mr. Phillips learned the drug business in Boston and Newburyport, Mass., and married his wife, Miss Pierce, in the latter city. He removed to Portland, Me., about 1854, and established himself in the retail drug business, in what was known as the Dr. Griffith stand, now the corner of Middle and Free streets. This store was burned in the great fire of 1866, and for a time thereafter he occupied a store on Fore street, but soon after he established himself in the wholesale trade at the corner of Middle and Pearl streets, where he remained until his retirement in 1881. Deceased was of a modest, genial disposition, very liberal in good works, and a very affectionate husband and father. He leaves a wife and one daughter to mourn their loss. Mr. Phillips became a member of our Association in the year 1859, at the meeting held in the city of Boston.

Orlando Tompkins, of Boston, died there of rheumatism of the heart after an illness of ten days, November 29, 1884. Mr. Tompkins went to Boston more than fifty years ago, from Little Compton, R. I., and entered the apothecary store of Wm. Brown, at the corner of Washington and Eliot streets, as an apprentice, remaining there until he bought the store corner of Washington and Winter streets. There he remained many years, increasing the number of his friends by his attention to business, and accumulating a handsome property. Mr. Tompkins had a large circle of friends who appreciated his many excellent traits of character. He was a keen but very honorable man in all his business transactions. He married the daughter of the late Nathan Viles; his widow and two sons survive him. Deceased became a member of our Association in 1859, at the meeting held in the city of Boston.

John Frey, of New York City, died there in December last, at the ripe old age of seventy-eight years. For nearly half a century he was in charge of the drug department of Bellevue Hospital. For some time prior to his death he had been failing in strength. He was known as a quiet, unostentatious, but methodical and reliable man, a competent pharmacist, a patient investigator in science, an admirable microscopist, and an honest man. He has filled his life-work honorably and well, leaving many friends but no enemies. He was a life member of the New York College of Pharmacy, and at one time served in its Board of Trustees. At a monthly meeting of the Board of Trustees his excellent traits of character were mentioned by his associates and friends, and appropriate resolutions were passed. Deceased became a member of our Association at the 13th annual meeting, held in Boston in 1865.

Wm. A. Gellatly, of New York City, died there on February 13, 1885, after an illness which had necessitated his absence from business for only a week. The disease was typhoid pneumonia. Mr. Gellatly was born in Edinburgh, Scotland, in 1831, and came to this country when four years old with his parents, who settled in Illinois. His home was soon transferred to New York city, where, as a pupil in the public schools, he made rapid progress in his studies. When thirteen years of age he entered the service of W. H. Schieffelin & Co. in the capacity of an errand boy. A few years later he attended the New York College of Pharmacy. By successive steps he rose from one position of trust to another until, in 1860, he became a partner. For some years he was the senior member of the firm of W. H. Schieffelin & Co. The deceased's wide personal influence and his very successful business career were by no means accidental, but were legitimate rewards of industry, honesty, and a well marked individuality. Of late years much of his time and thought were devoted to the important questions connected with the tariff and the internal revenue, and he was actively instrumental in the removal of the stamp ax on proprietary medicines. The Committee on Ways and Means of Congress, frequently cons lted Mr. Gellatly in relation to questions affecting the revenue derived from imported drugs, and many of the later changes in tariff rates were made at his suggestion. He was one of the founders of the National Wholesale Drug Association, and the last President but one. He was a member of the Chamber of Commerce, and a Director of the Board of Trade and Transportation. His sudden departure called forth many expressions of sorrow and esteem. Among the organizations which took official action were the New York City Drug, Paint, and Chemical Exchange, the Association of Manufacturers and Dealers in Proprietary Medicines, the Chicago Wholesale Drug Association, and the Wholesale Druggists of Boston. His home life was peculiarly happy. He leaves a wife and several children to mourn his loss. Mr. Gellatly connected himself with our Association over twenty-six years ago, at the meeting held in the City of Washington, D. C., in 1858.

William H. Crawford died at St. Louis, Mo., March 17, 1885, of fatty degeneration of the heart. He was born at Donegal, Ireland, in 1841, and was therefore forty-four years of age. He was the son of James and Mary Crawford, who came to the United States in 1850, bringing with them their three sons and two daughters. They settled in Wheeling, W. Va., where Wm. H. afterwards entered the store of F. A. Brentlinger as an apprentice in the drug business. He came to St. Louis in 1857, and was employed in the drug business first by Alexander Leitch and afterwards by Samuel A. Hendel. In 1861, he started in business on his own account, at the northeast corner of Eighth and Washington streets. At the time of his death this establishment was located at 701 Washington street, he having been compelled to move twice on account of changes in the buildings which he occupied. Other stores which he had established were sold previous to his death, and, by contracting his business cares, he was prepared to lead a less laborious life. To obtain rest, which he felt was much needed, he contemplated a trip to Europe. He was eminently successful in business; to this the comfortable fortune which he leaves behind him testifies. This is inherited by his brother and sisters, he dying a bachelor. For twenty years he was almost continuously an officer in the St. Louis College of Pharmacy, occupying at different times the office of President, Vice-President, Trustee or Corresponding Secretary. His counsel was always wise, his labor assiduous, and his interest unfailing. He became a member of our Association in 1864, at the meeting in Cincinnati, and was our authorized agent for St. Louis at the time of his death, Local Secretary for 1870–71, and Third Vice-President in 1878–79. He took a deep interest in the affairs of the Association, and quite frequently attended the annual meetings.

Thomas J. Covell, of Rock Island, Ill., died at his father's residence, at Lynn, Mass., March 21, 1885. For some time he was in the employ of Dr. Squibb, and while there graduated at the New York College of Pharmacy, in the year 1869. Afterwards he was in the employ of McKesson & Robbins, of New York, and with T. Metcalf & Co., of Boston. For some years he was in business for himself, and then accepted a position as apothecary at the Soldiers' Home at Tagus, Me. Deceased had been in poor health for a long time. He was greatly respected, stood very high in his profession, and was one of the most generous of friends; and many will miss his genial counsel and excellent advice. At his request he was buried at Woburn, Mass. Mr. Covell was elected a member of our Association at Cincinnati in 1864.

Emil Albrecht, a well-known druggist of Tamaqua, Pa., died there of dropsy and typhoid pneumonia. Mr. Albrecht had quite a chequered career. He was born in Magdeburg, Prussia, in 1839, and was 46 years old at the time of his death. Mr. Albrecht attended and passed through the classical school in Magdeburg, and then went to Brazil as druggist on board of a Prussian man-of-war, and for his able services he was presented with a silver medal by the Prussian government. While in Brazil, at the imminent risk of his own life he rescued a child from a terrible death by fire, and Emperor Dom Pedro rewarded his bravery by also presenting him with a valuable and massive silver medal. During his absence in Brazil his parents came to the United States, and in 1868 he followed, with the intention of paying them a visit at Wilmington, Delaware, where they resided. He decided to remain in this country, and after being engaged at his chosen profession in Philadelphia less than two years, in 1870 he went to Tamaqua, where he remained until the day of his death. Deceased became a member of the Pennsylvania Pharmaceutical Association at its first annual meeting. He took great interest in his profession, and was loved and respected by all who were acquainted with him. In the year 1875, at Boston, Mr. Albrecht became a member of our Association.

Ferdinand Hassencamp, of Baltimore, Md., died there on the 29th of April, 1885, after a long and painful illness. Mr. Hassencamp was born in Marburg, Germany, where he received his pharmaceutical education, and came to this country, already married, about 32 years ago. After a short stay in Richmond, Va., he settled in Baltimore, where he remained until his death. He was not only an excellent pharmacist and business man, and most amiable in social intercourse, but was also one of those few who never tire in sacrificing their time and personal comfort, and often important private interests, for the public good. As one of the directors of the Maryland College of Pharmacy, and as president of the Board of Pharmacy, he stood in the foremost rank among the pharmacists of Baltimore, and worked faithfully for the advancement of his profession and for the best possible education of the young pharmacists. Yet almost more important and beneficial were his labors in another direction, as either president or director of many public and private charitable institutions; among which were the German Society, Orphan Asylum, Home of the Aged, and House of Refuge. Mr. Hassencamp leaves, besides his widow, three sons and a daughter Deceased connected himself with our Association at the meeting held in the city of Cleveland, in 1872.

Dr. Samuel E. Tyson, of Washington, D. C., was born November 16th, 1809, in Baltimore, Md., and died at Alnwick, Prince George county, Md., on March 26, 1883. He was educated as a physician, which profession he faithfully, conscientiously, and perseveringly practiced in Washington city until his health failed. He married Miss Rachel Lukens, of Georgetown, D. C., and soon after engaged in pharmacy, successfully conducting one of the most prominent drug stores in Washington until 1871. A short time after the death of his wife, in 1877, he retired into the country, where he died six years after. In his private life, as well as in his professional and business career, he was controlled by the meekness and humility characteristic of the Society of Friends, of which he died a worthy member. No privation or self-sacrifice was too great for him to make for the benefit of his fellow creatures. Deceased was a life member of our Association, having been admitted to membership in 1857, at the meeting held in Philadelphia.

Wm. F. Scala was born in Washington, D. C., November 14, 1852, and died at the same place March 20, 1885, in his 33d year. Mr. Scala was educated at Columbia College, in Washington. In 1870 he entered the drug store of Mr. Welsh. He was one of the first students of the National College of Pharmacy, where he graduated in 1875, having for his preceptor Prof. Rudolph Oldberg. He engaged in business on his own account immediately after graduating, but his health failing, he gave up pharmacy in 1878 and tried another occupation for a year. He then returned to his original calling at the corner of 5th and East Capitol streets. He was an invalid for two years previous to his death. Mr. Scala was elected a member of the National College of Pharmacy in 1875, and in 1877 he was elected one of its trustees and made secretary. He was one of the college's most enthusiastic workers, and did great service in procuring the passage by Congress of the present pharmacy law of the District of Columbia. He was always genial in his intercourse, and was highly esteemed by all who knew him. He was married on March 20, 1885. Mr. Scala was added to the list of our membership in Philadelphia, in the year 1876.

John W. Sheddon died January 19, 1884, from hemorrhage of the lungs, at his residence in New York City. Born in Stamford, Conn., in 1826, he came to New York in 1838, and entered a drug store at the corner of Bowery and Fourth street, passing through the stages of apprentice, clerk and proprietor, until about five years since, when he disposed of it to one of his clerks. During a portion of this period he was joined by the late Wm. Neergaard, the firm opening a branch store at Broadway and Twenty-eighth street. Later, this partnership was dissolved, and some years afterwards he located a second store at Broadway and Thirty-fourth street, with which he was identified at the time of his decease. He was connected with the College of Pharmacy of New York City for many years as a member, a trustee, and vice-president; in 1866–1867 was Vice President of our Association. He was a large-minded and liberal man, well read, a splendid student, and well versed in all departments of literature. In his business, careful, exact, and competent, he enjoyed the confidence of the medical profession, and of patrons and friends. He leaves a widow, three sons and three daughters, to mourn the loss of a faithful husband and parent. Mr. Sheddon joined the Association at the fifth annual meeting in 1856.

Joseph R. Bond, of New York City, died there a few months ago. Deceased received a good common school education, after which he began the study of pharmacy in New York City, attended lectures at the New York College of Pharmacy, and graduated from there in 1874, with credit. Afterward he was in the employ of M. L. M. Peixotto, and of McKesson & Robbins, and for a time in the West. He was considered a good pharmacist, honest and upright in all his transactions. Mr. Bond was elected a member of our Association in Philadelphia in 1876.

Graham Wilder died at his residence in Louisville, Ky., January 17, 1885, after a brief illness. He was born in Louisville, July 1, 1843, and consequently was in his forty-second year. Mr. Wilder was a thorough scholar, having been educated at a private school in Louisville, and took deep interest in science. Of late years he devoted much of his time to the wholesale drug business, as a member of the firm of I. B. Wilder & Co. In a remarkable degree thorough and painstaking, careful to a fault, and in all that he undertook conscientious, he was successful in gaining the confidence, and securing the esteem of all having dealings with him. He was a true and warm friend, his counsel and advice were sought after by many, and were always given in a refined and courteous manner. He was a member of the Louisville College of Pharmacy, and one of the founders of the institution. Mr. Wilder became a member of our Associatiation at the meeting held in Philadelphia in 1868.

Ludwig Heller died in Chicago, Ill., on the 28th of January, 1885, of typhoid fever. Deceased came from Norway about two years ago, and located in Chicago, becoming a clerk in the store of S. K. Haanshuus, where he continued until December 24, 1884, when he was taken sick. He was attending medical lectures at the time, and having no relatives or near friends, at his request he was taken to the Cook County Hospital, at which institution he died. Deceased was about twenty-five years old. He became a member at our last meeting in Milwaukee, 1884.

Moses Oberdeener departed this life at his residence in Santa Clara, Cal., aged sixty years. For some time Mr. Oberdeener had been in failing health, caused by a cancer in the left breast. Deceased was born in Calvari, Poland, Russia, in 1825, was educated in Calvari, and married at the youthful age of eighteen years. He left the old home when but nineteen years old, and spent several years in Hungary, and subsequently in Wales, before he came to America in 1850. After remaining a couple of years in South Carolina and Georgia, he went to California and settled in Auburn, Placer county, where he engaged in business. He was burned out there, and shortly after returned to New York, where he remained about one year. Here he was joined by his wife and oldest son, then returned to California, and in Weaverville, Trinity county, was successfully engaged in business for about ten years. In 1871 he moved to Santa Clara, where he continued in the dispensing of drugs until failing health caused him to sell the business to his son Samuel, in 1882, who had for several years previously materially aided his father as an efficient clerk. Mr. Oberdeener amassed considerable property both at home and at San Francisco. During his residence at Santa Clara he made many warm friends, who admired him much for his stern character of principles and integrity. He was quick to denounce wrong, and equally quick to appreciate right. By his death Santa Clara loses one of her most respected citizens and business men. Deceased leaves four sons and a loving wife to mourn his loss. In 1880 Mr. Oberdeener was elected a member of our Association at Saratoga Springs, N. Y.

Henry B. Parsons died August 21st, at Tucson, Arizona, where he had gone to seek relief from hemorrhages of the lungs. Mr. Parsons was born November 20, 1855, at Sivas, Asia Minor, where his father, Rev. Benjamin Parsons, was then residing. When four years of age, his parents returned to this country, locating at Windsor, Conn. Subsequently they removed to Saline, Mich., where Henry completed a high school education. From the time he was sixteen years old he showed a liking and aptness for chemistry. He entered the University of Michigan School of Pharmacy in the fall of 1874, and was graduated in 1876. He remained at Ann Arbor as assistant for two years after graduation, and has ever since been an Alumnus in whom his Alma Mater took just pride, conferring on him at the last commencement the honorary degree of Master of Pharmacy. He was from the first ambitious to support himself, and did so through the college course. In the latter part of 1878, he went to Washington as special assistant in the chemical division of the Agricultural Department. Soon after, he accepted the professorship of Materia Medica and Botany in the National College of Pharmacy. He resigned his positions in Washington in December, 1881, to accept the superintendence of the construction and the working of the present laboratory and drug mills of W. H. Schieffelin & Co., of New York City. On August 2, 1883, he was married to Annie F. Taylor, of Ann Arbor. In May, 1884, he was obliged to give up the charge of the laboratory on account of a serious lung trouble, and, yielding to his taste for literary work, accepted the editorship of the "Druggists' Circular," which he conducted in a masterly manner until May, 1885, when, his health failing, he was obliged to give up work entirely. Acting upon the advice of his physician, he went to Arizona in June last, where he died. His valuable contributions to chemical literature embrace a treatise on plant analysis which has been incorporated in Allen's "Commercial Organic Analysis;" a table of oxidation and reduction, exhaustive work on opium, quinine, berberine, nitrous ether, oleates, etc., as well as important service in the revision of the U. S. Pharmacopœia of 1880. He had been tendered a professorship in the New York College of Pharmacy, of which institution he was for some time a trustee and an honored member which he declined. He was universally popular with all who knew him, and will be greatly missed, not only by a large circle of personal friends, but by readers of chemical and pharmaceutical literature generally. Mr. Parsons became a member of this Association in 1882, at the meeting held at Niagara Falls.

John P. Muth, of the firm of Muth Bros. & Co., wholesale druggists, of Baltimore, Md., died very suddenly at his place of business, August 17, 1885. The cause of his death was an attack of paralysis, the third which he had experienced during the past year. Mr. Muth began his career as an errand boy, and at length became a partner of the firm of Thomsen, Lilly & Co., which afterward became Thomsen & Muth. In 1884, with his brothers Joseph and George L., he founded the present house of Muth Bros. & Co. Mr. Muth was highly esteemed for the sterling business and personal qualities which enabled him to advance from a subordinate position to the front rank of the drug trade in Baltimore. At the time of his death he was fifty-two years of age. Deceased was elected a member of our Association at the meeting held in Cincinnati in 1864.

Ernest Dreher died in Newark, N. J., of brain fever, August 1, 1885. Mr. Dreher was born at Carlsruhe, Baden, Germany, in 1839, and at the time of his death was 46 years old. He came to this country in 1855, learned the drug business with Dr. Heinrich, of Newark, and was employed as clerk for six or eight years by the late C. W. Badger. He went into business for himself about the year 1870, and was well known as an energetic and reliable business man, a good apothecary, and a wide-awake citizen. He was a member of the Newark, and also a member of the New Jersey Pharmaceutical Association, in the welfare of which he always manifested a lively interest. Deceased leaves a wife and two sons to mourn their loss. His connection with our Association dates from the meeting held in Chicago, Ill., in 1869.

A. F. Wood, of New Haven, Conn , died there August 28, 1885, of consumption. He was born at Woodbury, Conn., and came to New Haven when quite a young man, serving an apprenticeship as apothecary. In 1845 he began business on his own account, and for forty years continued in the same location. He was a man of strict integrity in business, exceedingly earnest in the welfare of his vocation, but quiet and unassuming, and his store bore an excellent reputation as to the quality of goods which he handled. Deceased was one of the originators of the Connecticut Pharmaceutical Association. He leaves a widow, one daughter and three sons to mourn his loss. Mr. Wood became a member of our Association at the meeting held in the city of Philadelphia in 1876.

Prof. Dr. Francis Xavier Landerer was born in Bavaria in the year 1809, and studied philosophy and medicine at the University of Munich. When Otho I. was elected King of Greece, Landerer was called to Athens and attached to the School of Pharmacy. In 1834 a commission was appointed for preparing a Greek Pharmacopœia. The commission consisted of Prof. John Bauro, Prof. Landerer and Joseph Sartorius, apothecary to the court; and the Pharmacopœia, an octavo volume of 540 pages, was published in the Latin and new Greek languages in 1837. In the same year the University of Athens was founded, and Landerer was appointed professor of physics, chemistry and pharmacy; but in 1843 he had to vacate the chair in consequence of a resolution which resulted in the dismissal of the Bavarian officials. No suitable person being found to fill the vacancy, he was re-appointed by special act in 1845. In the meantime he occupied also the chair of chemical technology in the Polytechnic Institute, without receiving any compensation for the labor; and when his former pupil, St. Krinos, was appointed director of this Institute, Landerer was obliged to withdraw from the chair which he had filled gratuitously for twenty-five years. After the dethronement of Otho in 1862, and the accession of George I. to the throne, Landerer opened a pharmacy in Athens, and soon after resigned also his professorship in the University. In 1831 he commenced to write for "Buchner's Repertorium" and for the "Archiv der Pharmacie," his communications referring mostly to the origin and uses of oriental remedies. More recently and up to within a short time of his death, he contributed similar brief notes to other journals, many being on the same subjects which years ago were discussed in the "Repertorium.” Of late years Landerer's health failed, and he was mostly confined to his house or his bed until his sufferings were terminated by his death, which took place at Athens July 19th (old style July 7), 1885, at the age of seventy-six years. The deceased was honorary President of the Panhellenic Pharmaceutical Society, and an honorary or corresponding member of a number of scientific societies, and was elected an honorary member of our Association in Toronto, Canada, in 1877.

REPORT OF THE COMMITTEE ON PUBLICATION.

The Committee respectfully report that the manuscript for the last volume was completed and received in December, 1884, and shortly after nearly all the woodcuts used in the Report on the Progress of Pharmacy were loaned by the publishers of the “American Druggist,” “American Journal of Pharmacy,” and “Pharmaceutical Record,” and those for the papers of Professors Oldberg and Lloyd were furnished by these gentlemen. 6150 copies were printed, and the volume was issued in May of the present year, containing also the General Index to the volumes xviii to xxx (1870 to 1882 inclusive). The cost of publication was as follows:

General Index, compilation	$150 00	
Composition, paper, and press-work	687 00	
		$837 00
Proceedings, phonographic report	$120 00	
Composition, paper, and press-work	1159 55	
Phototype	60 25	
Binding and wrapping	387 65	
		1727 45
Journals for use of Reporter for 1884	$30 76	
1885	12 50	
		43 26
Other expenses of the Secretary, wood cuts	$13 00	
Duty on books	44	
Proof box with sign	4 50	
Packing-boxes	3 00	
Freight and expressage	81 56	
Postage stamps	139 52	
		242 02
Salaries of Reporter and Secretary		1250 00
		$4099 73

The following stock of Proceedings is on hand, stored at the Philadelphia College of Pharmacy:

1851.	301 in paper.			1869.	97 in paper.	141 bound.
1852.	81 “			1870.	107 “	91 “
1853.	82 “			1871.	89 “	56 “
1854.	54 “			1872.	96 “	2 “
1855.	97 “			1873.	14 “	97 “
1857.	246 “	15 bound.		1874.	130 “	21 “
1858.	56 “	3 “	130 loose.	1875.	64 “	41 “
1859.	— “	36 “		1876.	42 “	49 “
1860.	— “	195 “		1877.	48 “	80 “
1862.	— “	273 “		1878.	60 “	106 “
1863.	— “	265 “		1879.	22 “	93 “
1864.	178 “	111 “		1880.	85 “	45 “
1865.	154 “	20 “		1881.	51 “	43 “
1866.	67 “	75 “		1882.	50 “	66 “
1867.	151 “	80 “		1883.	46 “	135 “
1868.	54 “	139 “		1884.	58 “	76 “

The insurance on the above and other books remains the same as for a series of years past, it being $2500, in the German Fire Insurance Company of Philadelphia, at a premium of $15.

JOSEPH P. REMINGTON,
C. LEWIS DIEHL,
JOHN M. MAISCH.

REPORT OF THE COMMITTEE ON PRIZE ESSAYS.

TO THE PRESIDENT AND MEMBERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Gentlemen: The absence in Europe of one of the members of this Committee, and the illness and decease of another, have prevented action on the papers read at the last annual meeting. It is the opinion of the chairman, however, that such action as may be, should not be carried over to the next annual meeting, and he therefore suggests that the matter be referred to the Council, with the request to report before the adjournment of the Association such recommendations as may dispose of it.

Respectfully submitted, C. LEWIS DIEHL, *Chairman.*

The recommendation appended to the report of the Committee on Prize Essays was adopted, and the subject referred to the Council.

The President appointed on the Committee on Exhibition Messrs. G. W. Sloan, Indianapolis; Alonzo Robbins, Philadelphia; F. W. Whiting, Great Barrington, Mass.; J. W. Eckford, Aberdeen, Mass.; and Karl Simmon, St. Paul.

Mr. Sloan requested to be excused from the service, also Mr. Ebert, who was named by the chair. Mr. Menninger then volunteered to serve on the Committee, and was appointed in Mr. Sloan's place.

The Committee on the President's Address was appointed as follows: Messrs. Oldberg, Chicago; Bedford, New York; and Remington, Philadelphia.

Mr. Bedford desiring to be excused, Mr. Markoe was appointed in his place.

A motion to adjourn, made by Mr. Remington, prevailed.

SECOND SESSION—WEDNESDAY MORNING, SEPTEMBER 9TH.

The meeting was called to order by the President at 9:30. The minutes of the first session were read and approved.

The Secretary read the following telegram, sent by cable:

TO BRITISH PHARMACEUTICAL CONFERENCE, ABERDEEN, SCOTLAND.

The American Pharmaceutical Association, in session at Pittsburgh, sends hearty greeting.

JOHN INGALLS, *President.*

The Secretary also read the credentials of delegations from the Lee Co., Ia., and the Norfolk and Portsmouth (Va.) Pharmaceutical Associations. The delegates were, on motion, admitted.

The Secretary of Council read the minutes of the eighth session of

Council, at which the following business was transacted (8 members present):

The twenty-two candidates for membership, whose applications had been reported at the first session of the present meeting of the Association, were elected as follows:

Albert O. Ingalls, Murray, Shoshone Co., Idaho.
Henry C. C. Maisch, Chicago, Ill.
Otho Fen Smith Miller, Bremen, Ind.
Sixtus Ewald Seme Crona, Kain City, Kan.
William Fred Sawyer, Boston, Mass.
Elihu Bunker, New Bedford, Mass.
John Herbert Lawrence, New Bedford, Mass.
Chas. Jos. Val. Fries, Anoka, Minn.
E. Floyd Allen, Minneapolis, Minn.
Claus V. Rohde, Spring Valley, Minn.
Herman Herzfeld, New York, N. Y.
William M. Massey, New York, N. Y.
Robert E. Eccles, Brooklyn, N. Y.
Frank Richardson, Rogersfield, Clinton Co., N. Y.
Charles E. Ink, Columbiana, O.
Walter Theron Baker, Philadelphia, Pa.
William M. L. Weills, Harrisburg, Pa.
S. Henry Stevens, Pittsburgh, Pa.
William Jas. Todd, Pittsburgh, Pa.
Hazard Snowden Hutchison, Shamokin, Northumberland Co., Pa.
W. H. R. Smink, Shamokin, Pa.
Robert P. Frazer, Pictou, Nova Scocia.

The applications of five candidates for membership were examined, and directed to be reported to the Association.

The amendments to the by-laws of Council, proposed at the preceding Council session by the Committee on examination of the Treasurer's books were adopted, thus fixing the salary of the Secretary of Council at $50, and that of the Chairman of the Committee on membership at $150.

The Auditing Committee reported the Treasurer's annual statement to be correct.

After due consideration it was resolved that the Ebert prize be not awarded for any of the papers read at the meeting held in 1884.

On motion of J. M. Maisch, an order for $7.50 was directed to be drawn upon the Centennial Fund for material used by Mr. Rob. B. Warder, Lafayette, Ind., in investigations made by him, to be reported at the present meeting.

The minutes of the Council were approved.

The Secretary read the following report from the Nominating Committee:

PITTSBURGH, *September* 8, 1885.

At a meeting of the Committee on Nominations held this evening, the following nominations were made:

President—Joseph Roberts, Baltimore, Md.

Vice Presidents—Albert H. Hollister, Madison, Wis.; Albert B. Presscott, Ann Arbor, Mich.; Joseph S. Evans, West Chester, Pa.

Permanent Secretary—John M. Maisch, Philadelphia, Pa.

Treasurer—Charles A. Tufts, Dover, N. H.

Reporter on Progress of Pharmacy—C. Lewis Diehl, Louisville, Ky.

Council—Samuel A. D. Sheppard, Boston, Mass.; William Saunders, London, Ont.; Albert E. Ebert, Chicago, Ill.

Committee on Drug Market—Mahlon N. Kline, Philadelphia, Pa.; Thomas F. Main, New York, N. Y.; E. Waldo Cutler, Boston, Mass.; Daniel Myers, Cleveland, O.; Christian F. G. Meyer, St. Louis, Mo.

Committee on Papers and Queries—John U. Lloyd, Cincinnati, O.; William W. Bartlet, Boston, Mass.; Virgil Coblentz, Springfield, O.

Committee on Prize Essays—C. Lewis Diehl, Louisville, Ky.; Emil Scheffer, Louisville, Ky.; Oscar Oldberg, Chicago, Ill.

Committee on Legislation—John M. Maisch, Philadelphia, Pa.; Samuel A. D. Sheppard, Boston, Mass.; Edward Bocking, Wheeling, W. Va.

CHAS. A. TUFTS, *Chairman.*
J. W. COLCORD, *Secretary.*

The chair ordered an election for President, and appointed Messrs. Good, of St. Louis, and Rice, of New York, tellers, who subsequently reported to the President, and Mr. Joseph Roberts was duly elected as President the ensuing year.

On motion of Mr. Colcord, the election was made unanimous.

While the ballotting had been going on, the report of the Finance Committee was read, accepted and ordered to take the usual course.

Mr. Kennedy moved that the Permanent Secretary be directed to deposit an affirmative ballot for the remaining nominees, when Mr. Kline requested to be excused from serving as chairman of the Committee on Drug Market, he having prepared the report of that committee for the past two years.

Mr. Menninger then moved to amend Mr. Kennedy's motion, that the ballot be deposited for all the nominees except the Committee on Drug Market, the latter nomination being referred back to the Nominating Committee.

The amendment was accepted by Mr. Kennedy, and the amended motion adopted.

The affirmative ballot having been deposited by the Permanent Secretary, the President declared the nominees duly elected, and appointed ex-Presidents Gordon and Heinitsh a Committee to conduct the President elect to the chair. When the committee reached the platform with Mr. Roberts, the members arose, and President Ingalls said, addressing Mr. Roberts:

You occupy to-day, sir, a proud position. Its value is intensified by the fact that the position has sought you. I am aware that if your wishes had been consulted you would have preferred that the mantle should have fallen upon another. We know your high personal character, your devotion to pharmacy, and to the best interests of this Association, which has elevated you to the highest position, into which I introduce you as the duly elected President; and, sir, in honoring you the members have honored themselves.

PRESIDENT ROBERTS:—*Gentlemen:* The American Pharmaceutical Association is national in its scope and influence. I am no speaker, but I intend to serve you faithfully as your presiding officer, and to try to do my duty as I understand it from my standpoint, upholding the honor and dignity of this Association, which is a very dignified and very useful body. That is not exactly what I intended to say to you on this occasion, but it will answer the purpose.

President Ingalls introduced the three Vice-Presidents elect.

VICE-PRESIDENT HOLLISTER.—Mr. President, Ladies and Gentlemen of the American Pharmaceutical Association: Please permit me to say as an humble member of your profession, that I feel highly honored for this expression of your confidence in me in placing me in this position. For many years I have been, in my humble way, endeavoring to promote the best interests of pharmacy in the State of Wisconsin, and my constituents will bear record how well or how ill I have succeeded in that effort in my own State. I will say to you that the interest of pharmacy lies nearest and dearest to my heart, and the interests of this Association, I trust, shall be furthered by every effort that I am capable of. I have great interest in it, and I expect to have a growing interest in all your deliberations. Please accept my hearty thanks for this unmerited compliment in placing me in this position. I thank you, Mr. President, and gentlemen of this Association.

VICE-PRESIDENT PRESCOTT.—Mr. President and Gentlemen: I thank you for this compliment which you have paid me, and I accept it with the feeling that it is a compliment not accompanied with arduous duty. Standing as I shall behind our honored President and our esteemed Vice-President, any duty which I may have will be very slight, as I stand behind very strong representatives in this Association. Still, I thank you for the compliment.

VICE-PRESIDENT EVANS.—Mr. President and Gentlemen: I am more than ever convinced that the eccentricities of electricity are unaccountable. I felt last evening that the lightning must strike somewhere, and as it has struck in this direction, I can assure you that I feel highly honored for the confidence you have reposed in me this day. I am not unmindful of the dignity, responsibility, and trust of this position, and I assure you that you will not have to regret that you have conferred upon me this honor.

Mr. Kline read the report of the Committee on the Drug Market (see page 361), which was accepted and referred for publication. The suggestion of the Committee that the report be printed in the form of a pamphlet or circular, and sent to the members as early as possible in advance of the Proceedings, was favorably commented upon by Mr. Menninger, and a motion was made by Mr. Main that the suggestion be adopted.

MR. MENNINGER.—I do not like to see such a good report and such valuable suggestions go by without making some remarks in relation to them. There are two points in this report which strike every pharmacist forcibly: the decline of the profits of the retail drug business to which allusion is made, and the cause of it. The fact is stated that physicians are prescribing patent medicines, or proprietary medicines, which rank and stand exactly the same as patent medicines. These articles are first put out as "Elegant Pharmaceuticals," and gradually find their way into the grocery store and bar room; and to-day any well equipped bar room in the country has A. B. & C.'s elixir of quinine and strychnine, and similar things are put forth by the men who, to a large extent, make a profit out of the retail drug trade. Now, this is not the trade section of our organization, but I take this opportunity of saying that when this Association has established its formulary for unofficinal preparations, every druggist in the country ought to set his face against these "Elegant Pharmaceuticals," whose manufacturers claim great superiority for this elixir or that, because one has obtained his iron from such and such a mine, and another gets his cinchona by private conveyance. This thing has gone to the last extreme. They pretend to be friends of the retail trade; but they are undermining the trade and ruining it. It is a fact that our medical colleges are accepting all that come along, and matriculating them, while the pharmaceutical colleges of this country demand, most of them now, a certificate of the capacity to study, and a preliminary examination. Any man can come from his anvil or his plow, without preliminary education, and even without a right knowledge of his own mother tongue, and go into a medical college: do you expect that man, at the end of nine months, to write an intelligent prescription? He cannot, and we should, as a matter of self defense and protection to ourselves, call the attention of the community to this weakness and mental debility on the part of many physicians who write for a ready made prescription, about which they know nothing except what is printed on the label. I am glad the Chairman has alluded to some of these causes which are hurting us as tradesmen, and which are degrading us as professional men.

Mr. Painter.—Encroachments have been made upon the legitimate domain of pharmacy by the manufacturers of pharmaceutical preparations, who by their persistent effort, by fair means and foul, endeavor to trample out a cherished growth, and substitute a bastard, unhealthy and unwieldy one in its stead; and, more than this, they have the audacious effrontery, at least some of them have, to caution our patrons against substitutions, when the major part of the whole business is a base substitution, coming in where they have no right, and forcing their preparations into the prescriptions we daily dispense. And yet we patiently submit to this imposition, or make so feeble a resistance that the evil has grown from a small beginning a few years since, until it has reached its present prodigious proportions. The pharmacists are not altogether blameless, I admit. This wolf in lamb's clothing has been patted on the back, and the rapacious monster let roam at will over our premises, until he has gained such a firm foothold that it will require long and persistent and united effort on our part to dislodge him, or to tame him down—the gentle lamb that he claims to be!—ever willing to be sheared for our benefit, if we but feed him well. I do not mean, Mr. President, to cry down the manufacture of pharmaceutical preparations when confined to its legitimate province, and its province is wide and great. I believe a manufacturing pharmacist to be indispensable at the present time, and it is quite right and proper that they should vie with each other in furnishing the compounder and dispenser with the most perfect and reliable goods. The purification of commercial salts the preparation of ether, of abstracts, of extracts, of fluid extracts—if need be—and innumerable other articles, render the pharmaceutical laboratory a necessity. Its products, however, should be confined almost entirely to simples, and the compounding should be left to the dispensing pharmacist, where it rightfully belongs; but such is the grand exception rather than the rule. These manufacturers seem to vie with one another in the practice of useful combinations rather than in the quality of their goods, and they spend their efforts, and their time, and their money, in surrounding them with such exclusiveness as to make them empirical, bringing them on a par with their near relatives and close neighbors, the vile nostrums. These compounds have charlatanry stamped upon their face, and those of which I speak are infinitely more dangerous and far-reaching in their injurious effect upon pharmacy than nostrums; they are so insidious in their offices, and lead so gradually from the legitimate to the illegitimate, it is hardly surprising the pharmacists and physicians have been deceived and imposed upon, and are lured into aiding in this wholesale demoralization, until we now find pharmacy groaning under the burden.

We are suffering in our professional standing, and we are suffering in our pockets as well. Why, gentlemen, these manufacturers anticipate the diagnosis of the physician, and prepare his prescriptions for him before he has ever seen his patient. Then they send their circulars, their samples, and a glib-tongued salesman, and finally prevail upon the physician to order through the dispensing pharmacist these legitimate prescriptions, the medicine to go with it, which they might just as well order through a notion store, and indeed I have heard of some of them doing so. These manufacturers take from the dispenser what rightfully belongs to him—the compounding of such prescriptions;

besides that they make him pay for their advertisements for their circulars, their samples and their drummers. They spend hundreds of thousands of dollars in forcing upon the medical fraternity these ready-made prescriptions, making the pharmacist pay all expenses, by taking from him what should be, and what otherwise would be, his legitimate gain. In addition to all this they burden our shelves with a countless number and variety of those preparations, many of which are purchased to supply a demand which may never again occur. The balance not used in the first order is left upon our hands, there to accumulate, thus take up our valuable room, and remain a very abomination to the unfortunate pharmacist. Pills alone, by the way, are said to have reduced the prescription business twenty per cent., or even more—I mention these because they are the most numerous; but other articles are even more pernicious in their effect upon pharmacy. Just think of it, in pills alone there are not less than two thousand different sorts on my shelves, which I am compelled to keep to meet this artificially created and unhealthy demand. I am obliged to keep the same pill of six different makers under various sizes of the same material, and even then I am not able to fill always the orders that come in. In taking an account of my stock, a short time since, I found the pills in stock of a single maker to amount to more than five hundred dollars in cost, and besides these I have pills of five other makers. As an instance of the sort of pills that are ordered, let me mention a few taken from my prescription file, each of a specific maker. Pil. Syphilitic. No. 1. Pil. Aloes Strychniæ et Belladonnæ Comp.; Pil. Neuralg. without morphia; Pil. Emmenagog.—and there are hundreds upon hundreds of others. What could be made more empirical, or more of a burden to the pharmacist and damaging to his legitimate business and to his pride and to his reputation? But it is needless for me to go further into these grievances. They are patent to you all. It is more to the point to speak of the remedy.

First, let me say, however, that I do not wish to be considered illiberal in my views. The laborer is worthy of his hire. If the manufacturing pharmacist by his industry, by his perseverance, by his superior knowledge, discovers a new and valuable remedy, or a new process by which he can make a better quality than others of pepsin, a better extract of malt, a better emulsion of oil, or any other material improvement, let him patent his discovery, or secure it to himself by secrecy, and I will not complain, or say one word against his doing so; it is his privilege and his right; but by doing that he simply renounces any claim upon a liberal profession. It is unprofessional, and unworthy of any man who claims to be a member of a liberal profession. There is no excuse, however, for these manufacturers to bring in every conceivable manufacture, and lay claim to the whole business. They have no just claim beyond their own article, and that alone should be tolerated. As I said before, let them confine themselves to simples and none of us will object; but when they claim the whole category of medicine, it is time for us to interpose a mild protest at least. They anticipate the want of the physician by every conceivable combination; get old prescriptions, that have been written for patients who are dead and gone long since, compound all of the probable prescriptions required, and a great many barely possible ones; they then send their cappers—excuse the expression—around amongst the medical fraternity to persuade them to think that this ready-made prescription, this quack stuff, is the panacea required for their patients of the future. At the same time, they take pains to caution the physician to be sure to write for Empiric & Co's. article, or they may get the worthless stuff of some designing manufacturer, or maybe, the questionable drugs of the superannuated old apothecary around the corner. Gentlemen, they further add insult to injury, by telling physicians that their quinine is better, and that their other articles are better, than can be found in the average drug store, and their prescriptions are more accurately prepared, when they know it is a falsehood and a base slander. It makes me rise in righteous indignation, when I hear of such a thing and know that retail pharmacists get the cream of their supplies furnished by the wholesale drug houses, and yet they are often old, discolored and musty, and otherwise rendered unfit for retail sale, and such should be rejected and sent back again. How often have you heard a wholesaler tell you that such and such a sample is good enough in making preparations, althought it does not look as another sample. I must not detain you longer. The remedy I would suggest to abate this evil—we can hardly hope to completely cure it immediately—is for this organization as a body, the head and front of pharmacy in this country, to put itself on record in the matter by adopting appropriate resolutions and recommendations for its members to never let an opportunity pass to show up this ready-made prescription business in its true light, especially to the medical profession, and furthermore, never to dispense a single one of these factory-manufactured prescriptions, unless it be especially ordered by the prescriber. Be prepared to meet the demand with pills, elixirs, and syrups, which you can, of your own knowledge, vouch for being what they purport to be.

MR. COLCORD.—In a letter received from the Secretary of the Association at San Francisco, the remark is made that they are suffering now from the pernicious system of payment of percentages to physicians, amounting in many cases to sixty per cent. of the gross receipts. Is that the case in San Francisco?

MR. PAINTER.—That, I am sorry to say, has been the case in San Francisco. I have not been in San Francisco myself for several years, but legislation has been had making this a misdemeanor, so as to make such things odious. I hardly know the state of affairs there just now.

MR. ELIEL.—The remarks made by Mr. Painter on this subject of manufactured medicines, I agree with to a certain extent. I could not have stated the subject in the eloquent manner in which it has been done; but I would say that it is high time some action was taken in regard to these encroachments by manufacturing pharmacists. I don't know of a better way than for this Association to take some action upon the proposition for an unofficinal formulary. I regret very much that the committee having this matter in charge did not bring before this Association a line of samples of the goods made in accordance with the formulary published under the auspices of the societies of Brooklyn and New York.

A call being made for the question before the meeting, Mr. Ebert moved to amend Mr. Main's motion, that it be referred to Council with power to act. The amendment was not seconded, and the question being taken on the original motion, it was adopted.

The Treasurer now read his annual report as follows:

TO THE OFFICERS AND MEMBERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION:

Gentlemen: In conformity with the requirements of the By-laws, I herewith present the report of the Treasurer for the past year:

All the bills presented to me at the date of my report have been paid, and there is a balance in the treasury of $4278.79. This does not include the Ebert Fund, $729.55; the Centennial Fund, $1359.36; and the Life Membership Fund, $1429.47, which are safely invested. This makes a total of invested funds of $3518.38. The balance is not so large as last year, for several reasons. By vote of the Association, $316 was taken from the General Fund and added to the Life Membership Fund; $687 was paid for printing the index to the volumes of the Proceedings from 1870 to 1882, inclusive, and $497.73 was paid for expenses of the Milwaukee meeting. A small number became members of the Association last year, and our receipts for annual dues have not been so large as in preceding years. The Treasurer has made unusual efforts with the collection, but the depressed condition of business throughout the country has neutralized his exertions. There is a large amount due from the members, and the Treasurer hopes to make a large increase in the funds of the Association before he sends out the bills for next year.

The Treasurer has no suggestions to make at this time. The reforms inaugurated in the last few years are working well, and the continuation of them hereafter we believe will still further confirm the wisdom of their adoption.

Two decades have passed since you have elected your present Secretary and Treasurer. At that time the Association had but a few hundred members, and a barren treasury. Now it numbers thirteen hundred and twenty-four on the published list, and has a total of $6,847.17 in the treasury. May not these two officers, as well as the members, congratulate themselves at the agreeable change?

Ten years since, in 1875, the Association held its annual meeting in Boston. One hundred and forty were elected members at that time. During the year there were twelve deaths, eight resigned, and forty two were dropped from the list for non-payment of dues.

In 1876 the meeting was held in Philadelphia. One hundred and forty-seven were elected members. During the year eight died, five resigned, and thirty-two were dropped for non payment.

In 1877, the meeting was held in Toronto. Forty-five members were elected. During the year fourteen died, twenty-four resigned, and fifty-five were dropped from the rolls.

In 1878, the meeting was held at Atlanta, and fifty-seven members were elected. During the year ten died, thirteen resigned, and sixty-one were dropped,

In 1879, the meeting was held in Indianapolis. Eighty-two members were elected. During the year fifteen died, nineteen resigned, and twenty seven were dropped.

In 1880, the meeting was held in Saratoga. One hundred and fifty-six members were elected. During the year fifteen died, fifteen resigned, and sixty seven were dropped.

In 1881, the meeting was held at Kansas City. One hundred and forty-two members were elected. During the year sixteen died, fifteen resigned, and fifty two were dropped.

In 1882, the meeting was held at Niagara Falls. One hundred and twenty-eight members were elected. During the year eighteen died, eight resigned, thirty-seven were dropped.

In 1883, the Association met in Washington. Eighty-six members were elected. During the year thirteen died, sixteen resigned, sixty-seven were dropped.

In 1884, the meeting was held in Milwaukee. Thirty-eight members were elected. During the year, eleven died, seven resigned, sixty one were dropped.

During the twenty years, one thousand nine hundred and seventeen members have been elected, two hundred and sixteen have died, two hundred and forty-one have resigned, and nine hundred and thirty-five have been dropped for non-payment of dues.

So many changes, in addition to the removals of members, entail a vast amount of labor upon the Treasurer and Secretary. In my report of ten years ago, I used the following language in regard to my colleague. It is doubly appropriate now, and I crave your indulgence in the repetition.

"Your present Secretary and Treasurer were elected in 1865, and you will pardon me if I express at this time, my profound regard for the admirable officer associated with me. Our communications have been frequent, often daily, and during the long time associated together, not a single word but of kindness has passed between us, and as the years have rolled away, the intercourse has ripened into that of dear friends. We have rarely differed in what we believed to be for the interest of the Association. In a few instances, I have received unpleasant letters. Whenever he has known of it, my associate has come manfully to my defence. This delightful friendship will remain among my happiest recollections in the milestones of life."

My friends of the association will pardon my dwelling so long on this subject, but I feel sure the occasion merits it. It must be rare that two members of any association, particularly a scientific one, fill two important offices for a double decade without a single unpleasant word, a single unkind feeling; our only wish, our only aim, to make the Association all we would have it. We read of the love of David and Jonathan, and may we not believe that it occasionally finds a parallel in the nineteenth century?

Our roll of departed members for the last ten years includes some of the best names on the lists of the Association, and dear friends of many of us. May we ever keep their memory green!

Thanking all those who have assisted me in my work during the past year, and expressing my gratitude for the pleasant intercourse and correspondence with the members without exception, with kind wishes for all, I close my report.

CHARLES A. TUFTS.

1885.	RECEIPTS.	
July 1.	Balance of old account, August 21, 1884	$6260 57
	Amount received for Contributions to July 1st	3445 00
	" " Memberships	325 00
	" " Certificates.	82 50
	" " from the sale of Proceedings.	6 90
	" " Interest on Deposits.	129 68
		$10,249 65

1885.	RECEIPTS.	
July 1.	Balance on hand July 1st (from old account).	$6260 57
	Amount received for yearly contributions for 1880	10 00
	" " 1881	30 00
	" " 1882	175 00
	" " 1883	540 00
	" " 1884	1700 00
	" " 1885	960 00
	" " 1886	5 00
	" Memberships.	225 00
	" Life Memberships.	100 00
	" Proceedings	6 90
	" Certificates.	82 50
	" from interest on deposits.	129 68
	" from the National Druggists' Association, for the use of Hall	25 00
		$10,249 65

PITTSBURGH, *September* 8, 1885.

The undersigned have examined the reports and accounts of the Treasurer, and find them correct.

S. A. D. SHEPPARD,
W. J. M. GORDON,
Auditing Committee.

EXPENDITURES.

Proceedings.	Date.		No.		
	1884.				
$120 00	Sept.	6.	268.	Cyrus R. Morgan, stenographer.	
			269.	Henry C. Schranck, expenses	$187 40
		8.	270.	George W. Kennedy, expenses	200 00
500 00		6.	271.	C. Lewis Diehl, Proceedings.	
			271.	Albert E. Ebert, expenses	60 00
			272.	Edward W. Runyon, expenses	23 10
				Life Membership Fund	316 00
	Oct.	6.	273.	Joseph L. Lemberger, expenses	263 53
687 00			274.	Inquirer Printing Company, Proceedings.	
			274.	John M. Maisch, expenses	58 80
			275.	Timothy Costello, expenses	93 00
	Nov.	8.	276.	Thomas J. Macmahan, expenses	46 80
	Dec.	29.	278.	Charles A. Tufts, expenses	88 25
	1885.				
18 50	Jany	14.	279.	Inquirer Printing Company, Proceedings.	
			280.	Samuel A. D. Sheppard, expenses . . .	21 50
			281.	Henry Canning, expenses	21 50
		30.	282.	Joseph P. Remington, expenses	13 16
	May	16.	283.	John M. Maisch, expenses	56 26
		25.	284.	John M. Maisch, insurance	15 00
1159 55		20.	285.	Inquirer Printing Company, Proceedings.	
60 25		25.	286.	Frederick Gutekunst, Proceedings.	
	June	3.	286.	John M. Maisch, expenses	229 02
387 65		8.	288.	Inquirer Printing Company, Proceedings.	
		20.	289.	Charles A. Tufts, expenses	500 00
			290.	John M. Maisch, expenses.	750 00
		29.	291.	Charles A. Tufts, expenses	37 79
			292.	Charles A. Tufts, expenses	56 80
$2932 95					
					$3037 91
					2932 95
					$5970 86
				Balance to new account	4278 79
					$10,249 65

EXPENDITURES.

1885.			
July 1.	Paid for *Proceedings:*		
	Inquirer Printing Company, printing	$1865 05	
	" " binding	387 65	
	Cyrus R. Morgan, stenographer	120 00	
	Frederick Gutekunst, photographer	60 25	
	C. Lewis Diehl, salary as Reporter of the Progress of Pharmacy from Sept., 1883, to Sept., 1884 . . .	500 00	
			$2932 95
	John M. Maisch, salary from Sept., 1884, to Sept., 1885	750 00	
	John M. Maisch, miscellaneous expenses, including the expense attending the meeting at Milwaukee, printing, stationery, freight, expressage, packing boxes, and postage	344 08	
			1094 08

	Charles A. Tufts, salary from Sept., 1884, to Sept., 1885	500 00	
	Charles A. Tufts, miscellaneous expenses, including the expense attending the meeting at Milwaukee, printing, stationery, expressage, filling out certificates, expenses of collections in cities and postage.	182 84	682 84
	George W. Kennedy, salary as Secretary of the Council from Sept., 1883, to Sept., 1884	25 00	
	George W. Kennedy, as Chairman Committee on membership from Sept., 1883, to Sept., 1884	175 00	200 00
	Timothy Costello, balance of expenses of the Washington meeting		93 00
July 1.	By *Joseph L. Lemberger*, balance of expenses of the Entertainment Committee		263 53
	Thomas J. Macmahan, expenses Milwaukee meeting		46 80
	Henry C. Schranck, expenses Milwaukee meeting.		187 40
	Joseph P. Remington, expenses as Chairman of the Council		13 16
	Albert E. Ebert, expenses to Philadelphia.		60 00
	Samuel A. D. Sheppard, expenses attending meeting of the Council		21 50
	Henry Canning, expenses attending meeting of the Council.		21 50
	Edward H. Runyon, expenses of California Committee		23 10
	Insurance of the property of the American Pharmaceutical Association with the German Insurance Company, stored in the Philadelphia College of Pharmacy		15 00
	Life Membership Fund.		316 00
			$5970 86
	Balance to new account		4278 79
			$10,249 65

1885. LIFE MEMBERS.

July 1. Two members have become Life Members during the past year, and one hundred dollars have been added in consequence to the Life Membership Fund

The *Investments* are as follows:

EBERT FUND.

Amount in United States Government Bonds	$613 10	
Amount deposited in the Savings Bank for the County of Strafford.	116 45	$729 55

CENTENNIAL FUND.

Amount in United States Government Bonds	$1226 20	
Amount deposited in the Savings Bank for the County of Strafford.	133 16	1359 36

LIFE MEMBERSHIP FUND.

Amount in United States Government Bonds	$1348 82	
Amount deposited in the Savings Bank for the County of Strafford	80 65	
		1429 47
		$3518 38

1884,

BILLS RECEIVABLE.

July 1. The following amounts are due the Association:

1	Annual fee,	1879	$5 00
6	"	1880	30 00
9	"	1881	45 00
38	"	1882	190 00
166	"	1883	830 00
578	"	1884	2,890 00
1002	"	1885	5,010 00
			$9,000 00

1885.

LIABILITIES.

July 1. The Association will owe the following bills September 1st:

C. Lewis Diehl, Reporter on the Progress of Pharmacy	$750 00
George W. Kennedy, Secretary of the Council	25 00
" " Chairman of Committee on Membership	175 00
" " bills for printing	107 54
	$1,057 54

These are the only claims against the Association, according to the best knowledge of the Treasurer.

1885.

TOTAL ASSETS OF THE ASSOCIATION.

July 1.	Cash on hand	$4,278.79
	Less bills payable	1,057 54
		$3,321 25
	Total investments	3,518 38
		$6,739 63
	Prospective assets	$9,000 00

The report of the Committee on Legislation was read and accepted (see page 374), also the report of the Committee on Legislation regarding Proprietary Medicines. The resolution attached to the latter report, that it is the deliberate opinion of this Association that the labels of proprietary medicines ought to carry a statement of their constituents, was, on motion of Mr. Thompson, unanimously adopted.

The following report was read, accepted and referred:

REPORT OF THE COMMITTEE TO VISIT THE NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

Mr. President and Gentlemen: Your Committee appointed at the last meeting to visit the National Wholesale Druggists' Association during their convention held at St. Louis in October of last year, beg leave to report that they had the great satisfaction of being received and treated with perfect cordiality and friendship. The members of that

Association duly appreciated your fraternal feelings with which we saluted them, and especially recognized and fully understood the position which we maintained ,as being obtained by and for yourselves through the promotion of a liberal scientific education among the aspiring youths, and thus developing the spirit of scientific research among your members. Your Association was publicly congratulated upon its success, and promised the energetic assistance of the wholesale druggists for the advancement of the common objects of both Associations. All of which is respectfully submitted.

ENNO SANDER, St. Louis, Mo.
J. M. GOOD, "
ALBERT E. EBERT, Chicago, Ill.
CHARLES HUSTON, Columbus, O.
VIRGIL COBLENTZ, Springfield, O.

The Committee on Papers and Queries was called upon to report:

MR. LLOYD.—I wish to state on behalf of the Committee that we have endeavored to obtain as many good papers as we possibly could. A new rule was adopted last year. The list of queries was published, and the members were solicited to write on these queries, regardless of whether they had been accepted by others or not. In consequence of that fact, we have in several instances two or three papers on the same subject, and it may be desirable, when these papers are reached, to have them read one after the other, and then have them discussed. The papers will show what we have undertaken to do. Regarding the future, I wish to beg of the members that they will endeavor individually to take an interest in encouraging the writing of papers for our Society. It is difficult for a committee of three to impress upon the minds of members the fact that the year will pass as quickly as it will. Many accept queries they propose to write upon at the time of the meeting, and after they get home they put it off, and frequently the paper is not written. I beg of you to step forward and accept queries, take part in investigations, and write papers.

A motion made by Mr. Remington that a committee of three on the time and place of the next annual meeting be appointed, was adopted, after which Mr. Bedford read the following:

REPORT OF COMMITTEE ON UNOFFICINAL FORMULÆ.

Your Committee respectfully reports progress. At the present moment it desires to recommend to the Association the approval of the objects of the New York and Brooklyn Formulary, and its eventual adoption as a basis for a National Formulary, if arrangements to this effect can be made with the Societies at present controlling it.

Respectfully,

CHARLES RICE,
P. W. BEDFORD,
WM. P. DE FOREST,
S. J. BENDINER,
A. TSCHEPPE,
Committee.

The proposed amendments to the By-laws were called up. The amendment to Chapter IX, Article II, Section 7, to insert the word "State" before the word "Associations," proposed at the first session,* was, after some discussion, unanimously adopted.

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* The amendment was proposed by Mr. Sheppard immediately after the appointment of the Nominating Committee.—SECRETARY.

The amendment to Chapter IV, Article IV, laid over from last year, (see Proceedings 1884, page 532), that the Treasurer's salary be increased from $500 to $600, and further modified by the action of Council reported at the first session (see page 525), to make it $750, was called up.

MR. SHEPPARD.—I think that we should look into this matter fairly. I feel, gentlemen, that we are running very close to the wind with our expenses. Our expenses and our income are altogether too nearly of the same figure. I think that our Treasurer's salary is none too large in proportion to the other salaries paid, but I think on general principles we are paying too large salaries.

MR. THOMPSON.— Mr. President, it appears from the reading of the report of the Finance Committee this morning, that with the amendment now pending, if adopted, the salaries for the coming year will amount to about $2,450. We have a roll of membership of about 950 who pay regularly each year, and it will readily be seen that about fifty per cent. of the annual dues paid by members of this Association will be consumed as salaries to its officers. I ask you to think of this for one moment, and see if we are not about to commit a mistake. Are we not on the road to expending our entire revenue in salaried officers? I believe in paying our officers well and fairly, but when we add to these salaries of the officers, the cost of publishing the proceedings and the necessary incidental expenses of this Association, it will be readily seen that the expense to the Association will be so nearly five dollars, within ten cents, I believe, of five dollars, to carry each paying member, for which it only gets five dollars. This is too fine financiering to ever be successful. The work of the Treasurer of this Association is no greater now than it has been for several years past. I don't see, and I have not seen it set forth, why his salary should be increased. If this Association was rich, and we chose to give the money away to our officers, we might do so, but the condition of our affairs does not justify any such liberality on our part. I therefore move you, sir, that this amendment to the by-laws be laid on the table.

The motion to lay on the table was decided by the chair to be not debatable, and it was carried by a vote of 24 ayes to 14 nayes.

Mr. Good having voted with the majority, moved to reconsider the vote, and Mr. Sheppard moved to amend that the resolution be taken up from the table. The chair decided that any business laid upon the table could be taken up at the pleasure of the Association.

MR. SHEPPARD: Mr. President, I did not wish to bring before the Association why, or not we were not willing to allow this matter to lay upon the table. I think that this Association should put itself on record in regard to salaries in general. I believe that the Treasurer's salary should be the same as the salary of the Permanent Secretary, and that of the Reporter on the Progress of Pharmacy. These salaries are seven hundred and fifty dollars each. If this salary is also made seven hundred and fifty dollars, that makes a total of $2250 for these three officers. We have now also to pay the salary of the Secretary of Council, who is also the chairman of the committee on membership—two hundred dollars—making a total of two thousand four hundred and fifty dollars. There are also the necessary expenses of the committees which come in each year. What I want to bring to the attention of the Association is, the easy way of spending money. My remarks are not intended to be directed towards the salary of the Treasurer in particular in preference to any one else, but what I deprecate, gentlemen, is the general tendency of spending too much money. I think that the reform should be in the way of general retrenchment, and that is the point I want to bring before the Association in order to get the expression of opinion of the Association on that point, and not merely on the increasing the Treasurer's salary. He does an immense amount of work, and I wish we could give them all a thousand dollars a year. They earn it, every one of them.

MR. EBERT: The reason I objected was because of the way in which this was done. The salaries of the other officers were raised to seven hundred and fifty dollars, and I think there should have been an opportunity allowed for expression of the views of the members as to why we thought we ought to raise the salary of the Treasurer, who is doing just as much work as the other officers, and without the same compensation—that is all. Now if the Association wishes to cut off expenses, I believe we ought to do it with all officers, and not with one. It is not seemingly fair.

MR. BARTLET.—I would like to ask Mr. Sheppard to give us some explanation how he will reduce the expenditures by increasing the salary of the Treasurer. It seems to me he recommended an increase of the Treasurer's salary so that it would be equal to that of the Secretary, and at the same time he advocated a reduction of the expenses.

MR. SHEPPARD.—The answer to Mr. Bartlet is a very simple one indeed. It is that in equity the salary of the Treasurer should be the same as that of the two other officers. Following that is the general idea that the salaries should all be reduced—in other words that we should cut down the whole of our expenses. I don't think we can do it here in a large body like this. The only plan I have to suggest in the matter is, that Mr. Thompson's motion to lay this matter on the table may after discussion prevail, and that the Council be directed in some way to look into the matter and bring in some comprehensive plan which shall reduce our expenses. That's what I am trying to get at, gentlemen. I would like to see our expenses reduced, because they are altogether too close to our income.

MR. REMINGTON.—Mr. President, not wishing at all to prolong the discussion of this matter, as the time is very valuable, and having gone over the account of the Finance Committee very carefully, I cannot say that I agree with the opinion of Mr. Thompson or Mr. Sheppard. I do not believe that this small addition to the salary of the Treasury is going to run the Association into any danger of bankruptcy. I would say for the information of the members of the Association that so long as we have as careful a watch-dog over the Treasury as Mr. Sheppard, there is not the slightest danger of our running aground with the finances of the Association; they continually improve, and the report of the Chairman of the Finance Committee, which has been read this morning by the Secretary of the Council, is directly in the line of safety and conservative management. You have no doubt attentively listened to that report. He does not bring in any sickening statement as to the treasury; he tells you the worst that is to be known; but the Association is not in a bad way, it is in a safe condition. I think that this Association can very easily raise the salary of the Treasurer. You will also bear in mind that Mr. Sheppard is still a member of the Council, and he undoubtedly will be a member of the Finance Committee; therefore, I think it is perfectly safe to adopt this without any risk of bankrupting the Association. I say, moreover, that there cannot be any more legitimate and proper object for this Association than to reward its faithful officers in the way in which they should be rewarded. Now this question of salary commensurate with the service has none superior, I submit. There is no more legitimate object this Association can enter into than to reward its faithful officers.

The question was then ordered on the original motion to so amend Article IV, Chapter IV, of the By-laws as to make the Treasurer's salary

$750 per year, instead of $500, as it stands at present. The vote being taken, 28 members voted in the affirmative and 14 in the negative; the amendment was lost, not three-fourths of the votes being in favor of the amendment.

On motion of Mr. Sheppard, seconded by Mr. Thompson, the Council was instructed to consider the expediency of reducing the expenses of the Association, and report as early as convenient.

The amendment proposed by Council at the first session (see page 525), to strike out Chapter IX, Article V, and all other references in the By-laws to the exhibition, was brought forward.

MR. EBERT.—This is in the line of economy. The exhibition costs this Association annually a couple of hundred dollars, and besides imposing a great deal of trouble upon the Local Secretary it keeps up a constant irritation. It was thought advisable, in view of the difficulties encountered within the last two years, to allow the exhibition to be controlled by those who exhibit, and the Association have nothing more to do with it except to visit it the same as other visitors. The exhibitors can do it better than we can. Coming to the city where we go, they can make arrangements for the hall, and do all the necessary work, much better than we can. It seems certainly desirable to get out of it and to relieve our Local Secretary. It often happens that the Local Secretary for some little irregularity causes a bad feeling in his own city and among his own townsmen, and gets their enmity.

MR. KLINE.—Allow me to say upon this question that I believe it is a move in the right direction. I believe that this resolution as read should be adopted. It is a matter of surprise to me, however, to hear the statement made that the exhibitions have been an expense to the Association. I don't know how that can be, since the space is paid for; what other expenses there may be in connection with the exhibition I do not know. However that may be, we now have a practical illustration that parties have been solicited by the officers of this Association to bring here exhibits creditable to the meeting; that when the time by the official programme is announced for visiting the exhibits, it is passed by; and that the entertainment programme beginning at two o'clock, while about one o'clock it will be dinner time, there will be no time for visiting the exhibits. That is practically ignoring the exhibits. I do not know whether this is right or wrong; but it is certainly better for the Associotion to withdraw its sanction entirely, in the manner contemplated in the resolution.

MR. BROWN.—Many who come here with exhibits try to make money out of them, and I believe the day of exhibiting has passed in the way of usefulness. I suggest that exhibits should be presented at the sessions of this Association, and that every exhibit made should be accompanied with a paper stating the objects of the article exhibited, the advantages that it possesses, and its mode of manufacture, so that the pharmacists may be benefited. Should this be done, I believe it might be of value.

MR. MARKOE.—My impression is, we shall have just as full exhibitions in the future as we have had in the past. The gentlemen do it for a business purpose, and they go to wherever the place of meeting is for the purpose of exhibiting. Exhibitions follow the meetings of the various State medical and pharmaceutical associations, without expense to the Associations, and in many instances very creditable exhibits have been made, and there is no responsibility assumed. I think that we shall get just as much instruction without the official sanction of the Association as we can with it. I certainly hope this resolution will pass, and if it does we shall be relieved from the annoyance of this whole subject.

The amendment to strike out from the By-Laws Chapter IX, Article V, and all other references to the exhibition, was then passed without a dissenting vote.

Further amendments to the By-Laws, laid over from previous sessions (see page 521), were called up, explained and adopted, as follows:

Chapter IX, Article II, Section 4: The concluding sentence, "The Secretary shall then call the roll, noting the names of the delegates and members in attendance," was stricken out.

Chapter IX, Article IV, was altered by striking out the sentence: "The order of business at subsequent sessions shall be determined by the Council, with the consent of the Association;" and by inserting the following: "At each subsequent session except such as may be held for specific purposes, after the expiration of one hour from the appointed time of meeting, the report of the Committee on Papers and Queries shall be considered, unless by a vote of three-fourths of the members present and voting thereon."

The Association then adjourned to visit the exhibition room, and to meet again on Thursday morning at 9 o'clock.

THIRD SESSION—THURSDAY MORNING, SEPTEMBER 10TH.

At the proper time the meeting was called to order by the President, and the minutes of the second session, after having been read by the President, were approved.

The Secretary read a communication from the Detroit Pharmaceutical Association, inviting the Association to hold the next annual meeting in the City of Detroit, Mich. On motion, this communication was referred to a committee of three on the time and place of the next annual meeting, on which committee the chair appointed Messrs. Wm. S. Thompson, Washington, D. C., S. A. D. Sheppard, Boston, and G. W. Sloan, Indianapolis.

An invitation from the Baltimore and Ohio Railroad Company to meet at Deer Park, Ind., was presented by Mr. Macmahan, and referred to the same committee.

A motion was made by Mr. Sheppard to reconsider the vote by which the Association refused to amend Chapt. IV, Article IV, of the By-laws, and on the motion of Mr. DeForest, that it be laid over for the present, was withdrawn.

The Secretary of Council read the minutes of the first session of the new Council, held September 9th, present 7 members.

The organization of the Council was effected by electing J. P. Remington, Chairman,

C. L. Diehl, Vice-Chairman, and G. W. Kennedy, Secretary. The standing committees are:

Committee on Membership—G. W. Kennedy, Chairman; H. J. Menninger, Jos. Roberts, A. E. Ebert and the Treasurer and Permanent Secretary ex-officio.

Committee on Finance—S. A. D. Sheppard, Chairman, J. L. Lemberger and T. H. Hollister.

Committee on Publication—J. P. Remington, Chairman, A. B. Prescott, Wm. Saunders, H. J. Menninger and J. M. Maisch.

Committee on Centennial Fund—Joseph Roberts, Chairman, S. A. D. Sheppard and J. M. Maisch.

In accordance with a previous resolution the Chairman presented the following addition to the By-laws of the Council, which was adopted.

The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman and Secretary.

2. Election of the Standing Committees of the Council as follows:

a. Committee on Membership, consisting of five members of the Council, the Permanent Secretary and Treasurer.

b. Committee on Finance, three members.

c. Committee on Publication, five members.

d. Committee on Centennial Fund, three members.

3. Unfinished and deferred business from the meeting of the last Council, or such business as is especially referred to the Council from the Association.

4. The reading of the names of new members as provided in the By-laws.

5. Reading of reports and appointment of committees.

6. New business.

7. Adjournment, and before the final adjournment, the minutes of the last session shall be read and approved.

The following applicants for membership, previously reported to the Association, were duly elected:

Robt. B. Warder, Lafayette, Ind.
William Simon, Baltimore, Md.
William C. Durkee, Boston, Mass.
George W. Voss, Cincinnati, O.
Philip Lehr, Cleveland, O.

The applications of four candidates were examined and ordered to be reported to the Association.

At the second session, held September 10th (8 members present), one application for membership was examined and referred.

The minutes of the Council were, on motion, approved.

Mr. De Forest moved, seconded by Mr. Colcord, that the suggestions of the Committee in regard to the New York and Brooklyn Formulary, as presented in a printed communication, be adopted; but on motion of Mr. C. W. Day, action was at present deferred.

Mr. Eliel offered the following, the adoption of which was moved by Mr. Painter:

WHEREAS, It has been demonstrated (by experience and the progress of science) that remedial agents are best exhibited in their simplest forms—the issuing by the numerous manufacturers of pharmaceutical preparations of such a multitude of mixtures of the various medicinal agents, has grown to such gigantic proportions that it has become a grievous burden to the dispensing pharmacist, detrimental to the best interests of pharmacy, and at variance with the progress of science: therefore be it

Resolved, That the compounding of prescriptions is a prerogative of the dispensing pharmacist.

Resolved, That we deprecate the mixing of remedies by the manufacturing pharmacist, which can as well be mixed by the dispenser as required.

Resolved, That it should be the aim of the manufacturer to present remedial agents free from admixture as far as possible, unless complete chemical compounds are formed by the admixture.

Resolved, That it is the duty of all pharmacists to discourage empiricism in its every form.

Resolved, That the course pursued by a majority of manufacturers of pharmaceutical preparations in issuing such a multitude of unauthorized combinations, and their methods of forcing them upon the dispenser, is hereby condemned by this Association, as being unprofessional, unjust to the dispensing pharmacist, and directly at variance with scientific advancement, both in pharmacy and in medicine.

Resolved, That it is the duty of every dispensing pharmacist to be prepared to meet the requirements of physicians in every way possible, and never to dispense a "factory-made prescription" that can be avoided, unless it is especially ordered by the prescriber.

MR. THOMPSON.—The action contemplated in the resolutions submitted to the Association by the Chairman of the Committee on Proprietary Medicines, is of very much the same character, and covers the ground about as far as this Association need go: and it seems to me like an unnecessary piece of business now to take up almost precisely the same thing and go over it again. The resolution offered by Prof. Prescott is very general in scope as an expression of opinion by this Association, and all we ought to do. I hope the gentleman will withdraw his resolutions.

MR. PAINTER.—As I understood the resolution of Prof. Prescott, it only related to proprietary medicines and patent medicines, on which your committee was especially appointed; but this has a more general scope, it is more comprehensive, and it includes all articles that are detrimental to the progress of Pharmacy, and especially preparations that do not come under the head of what are commonly known as patent medicines. I think it would be well to adopt this, or some similar resolutions, to place this Association in the right position in this matter with other organizations, and the members of the Association can work from that as a standpoint. Other National Associations have adopted such measures, and it would conduce in getting Pharmacy in a better condition than it now is.

MR. THOMPSON.—This Association would be in rather an equivocal position, by bringing to the notice of physicians elixirs, and other remedial preparations, so-called, and acting upon the report of a committee recommending the members of this Association to go into the manufacture of these same preparations, or of something which is supposed to simulate them, and in which this Association is to lend its name to these formulas; it will appear to the outside world rather inconsistent that we should also proceed by formal resolutions to deprecate these very things.

MR. GOOD.—I cannot help thinking that there is a great deal of sophistry about Mr. Thompson's position. I admire these resolutions very much, and I think that they are entirely consistent with any action we may take in reference to the adoption of formulæ. The object is to defeat this very thing which gives us so much trouble, and towards the same end Mr. Eliel's resolutions are also aimed.

Mr. Prescott.—The resolution adopted yesterday covers matter quite different from that of the present motion. The former resolution merely requires the composition of medicines to be stated, but does not express any opinion as to what preparations, what mixtures, may be legitimate in pharmacy. Now, upon this motion it seems to me that the objection brought up by Mr. Thompson is very well taken, and, on this account, that the motion as read was quite sweeping, and really fixes no limit. I don't know how we can fix a limit. Taking the U. S. Pharmacopœia, for example, the making of Dover's powder or similar mixtures is so well established that no one will object to them. As has already been intimated, the report of the Committee on Unofficinal Preparations is a report by which the profession of pharmacy hopes to rid itself of its present dilemma by authorizing very indispensable formulæ for mixtures of different agents, thereby putting, if possible, a check upon a mere copy or duplication of the same. Now, I am hardly ready to express an opinion as to whether by a motion we can adopt a limit which will be effectual. It will be very proper for us to put ourselves as an Association upon record in this matter, without raising the question as to what effect it will have. But it certainly seems to me that the motion before us is somewhat too sweeping.

At the request of Mr. Good, the resolutions were again read by the Secretary, and by Mr. Eliel slightly modified, as given above.

Mr. Brown.—I listened carefully to the reading of the resolutions, and it seems to me that there is a good deal of resolution in them. If these resolutions are passed by this body, will they be binding upon the members of the Association? Simply to pass the resolution amounts to nothing; we can resolve that such and such things cannot be done, while there are thousands who are entirely separated from us. Now, can we bind this Association to stand by these resolutions? If we do, every man holds in his hand the power to enforce them; but it is like the retail druggists resolving that no one shall cut prices, at the same time that they are doing it. If the men who compose the Association will abide by the resolutions, the thing is done; but if the object is merely to affect the manufacturer, it will amount to nothing. We may resolve that the manufacturers shall not do so, but the people themselves are the ones who invite the manufacturers to do it, and if they are not going to stand by the resolutions, the manufacturers will be compelled, from necessity, to manufacture these goods and sell them to the druggists.

The hour for the reading of papers having arrived, the order of business, on motion of Mr. Sheppard, was suspended for fifteen minutes.

Mr. Eccles.—I think, sir, that this question is one that we cannot settle here: it is not our place, it is not our function. I think that a resolution embodying a desire on our part that the American Medical Association should pass a resolution that such things shall not be prescribed, will settle the matter far better than any resolutions of this kind. We cannot stop the prescribing of such preparations, but the physicians can. It is for them to settle it, and not for us. A resolution suggesting to them the adoption of proper measures in their National Convention, I think is all we can adopt.

The question being taken on Mr. Eliel's resolutions, they were lost.

Mr. Sheppard called up the motion for the reconsideration of the vote on the amendment to Chapter IV, Article IV, of the By-laws.

The motion was carried, and the question being on the amendment to strike out $500 and insert $750, Mr. Thompson moved to amend by inserting $600 ; but after some discussion, withdrew his motion, and the amendment was adopted without a dissenting vote.

Mr. Remington moved that the order of business be suspended for twenty minutes to enable the Association to dispose of the report of the Committee on Report on Unofficinal Formulas.

The motion was carried, and the report was read as follows:

PROPOSITION FOR A NATIONAL FORMULARY OF UNOFFICINAL PREPARATIONS UNDER THE AUSPICES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

For many years past the dispensing pharmacists of this country have been subjected to annoyance and pecuniary loss by being compelled to keep on hand a large number of preparations originated by the founders or followers of the modern school of "Elegant Pharmacy," not only for supplying the popular and, to a large extent, artificially created demand, but also for filling the prescriptions of practitioners of medicine. The most obnoxious feature connected with this innovation was, and even at the present time is, that quite frequently the products of particular manufacturers were and are specified, thus compelling the pharmacist to keep in stock many "brands" of one and the same preparation.

Attempts to remedy this evil were made at different times, both by the American Pharmaceutical Association and by other bodies. Some of these attempts were moderately successful in certain circumscribed districts, but, on the whole, the movement did not seem to make much headway, owing to circumstances beyond the control of the originators.

Thinking that the time had arrived for making a renewed attempt, and, in fact, acting on the suggestion of Mr. S. J. Bendiner, of New York, the College of Pharmacy of the City of New York, the German Apothecaries' Society of New York, and the Kings County Pharmaceutical Society, about two years ago, appointed a joint committee to prepare a Formulary of Unofficinal Preparations which was to be brought to the notice of the medical profession, with the request to accept the formulæ therein contained—after examination and approval—and thereafter to abstain from specifying on their prescriptions the products of special manufacturers, whenever ordering any preparation for which a formula was given in the book.

It seems that this movement was undertaken at a more favorable time than previous one; for, since the former efforts were made, the subject of elegant pharmacy has been much discussed in all its bearings in the professional press, and the craze after elixirs and similar fancy preparations has, at this time, somewhat subsided, although the custom of physicians specifying manfacturers' names is still very prevalent in many parts of the country.

The Joint Committee thus appointed performed the duty assigned to it, to its best ability, and the result of its labors was duly brought to the notice of the medical profession.

It is gratifying to state that not only has the main object of the three societies been, to a large extent, secured, inasmuch as a large number of physicians in New York, Brooklyn, and the vicinity have actually abandoned the custom of specifying makers' names, but, in addition, the preparation of many of the compounds, for which formulæ are given in the book, has gradually passed into the hands of the retailer, to his benefit.

The Joint Committee, in order to insure a revenue from the sale of the book sufficient to repay the money advanced by the three societies for defraying the cost of publication, was compelled to copyright the work to prevent unauthorized reprinting, but it was expressly announced that the contents of the work were free for all to use. Furthermore, the book was sold at a low price, without any intention of realizing a profit.

Believing that the little work thus undertaken could be made more useful if it were enlarged so as to be applicable to the whole country, or, at all events, to a larger area, the Joint Committee, upon a proposition made by it to the several societies, has been authorized to invite the co-operation of the American Pharmaceutical Association, with a view of having the little work form the basis of a larger national formulary, eventually to be published and controlled by the American Pharmaceutical Association.

To carry this plan into effect, it is intended to submit to the American Pharmaceutical Association the following propositions:

1. The Joint Committee of the New York and Brooklyn Formulary, on behalf of the three societies which it represents, tenders to the American Pharmaceutical Association the work prepared and controlled by them, for the purpose of using it as a basis for a National Formulary, to be gradually augmented and improved, under whatever title the Association may see fit to give it.

2. In order to preserve the copyright of the three societies controlling the New York and Brooklyn Formulary intact until it will be known that the Association will accept the task and continue the work, and, also, in order to afford protection to the Association itself, at least during the first period of the publication of the National Formulary, the three societies above named, who, being incorporated, can legally hold the copyright, invite the American Pharmaceutical Association to join them in the copyright, and thus to share its protection.

3. The Joint Committee will turn over all papers and records relating to the improvement and enlargement of the work in its possession, to the American Pharmaceutical Association.

A few suggestions, prompted by the experience which the Joint Committee has made since its existence, may here be offered. In the getting up of such a work, aiming to bring about uniformity in unofficinal preparations, which have to be repeatedly experimented with and remodeled from time to time, it is absolutely necessary that the working committee should hold frequent meetings. The members forming the committee, or at least its working nucleus, should, therefore, reside within a short distance of each other. They should, however, be assisted in their work by other members, judiciously distributed over the country, and by pharmaceutical bodies in general.

If the Association accepts the offer of the Joint Committee, it will, of course, be necessary to appoint a special Committee to take charge of this whole matter. In order to enable the latter to properly discharge its duties, it is suggested that a certain sum of money (say $250) be placed at their disposal, to be drawn against as needed. And, finally, it is suggested that the first, and any subsequent edition of the work issued under the auspices of the Association, be published under the personal supervision of the Committee at the time existing, the approval of the President having first been obtained.

Respectfully submitted on behalf of the Joint Committee of the New York and Brooklyn Formulary,

CHARLES RICE,
PETER W. BEDFORD,
SAMUEL J. BENDINER,
WILLIAM P. DEFOREST,
CHARLES F. SCHLEUSSNER,
Editing Committee.

New York and Brooklyn, Sept. 3, 1885.

MR. RICE.—I think the Committee on Unofficinal Formulæ which was appointed last year was selected under peculiar circumstances. I was not present at the meeting, but you will remember that the preceding committee informed the Association that they had been unable to make an elaborate report, for the reason that they had not been sufficiently assisted in their work. They also stated that they had made an attempt to induce the Joint Committee of the New York and Brooklyn Formulary to permit them to use the formulæ contained in their little work, which they were unable to do, owing to the fact that that little work was copyrighted.

The reply made by the New York and Brooklyn Committee to the Committee of this Association, in reference to this request, stated that the work had been copyrighted in order to obtain funds to reimburse the societies which had advanced the money for its publication, and for no other purpose; but that the Joint Committee would take the matter into consideration, and ascertain whether some method could not be found by which the whole work might be turned over to the Association. When the new Committee on Unofficinal Formulas was appointed last year, five members from the New York and Brooklyn Committee were elected, most likely with a view of reporting some plan by which the desire of the preceding Committee could be realized; and this Committee yesterday made a brief report. They have done no work beyond that bestowed on the improvement of their own Formulary, being convinced that they could prepare nothing better than what was already contained in this little book. A few months after the last annual meeting, this Committee dispatched a representative to the Council of the Association at one of its meetings in Philadelphia, with authority to offer the book to the Association; and the Association not being incorporated, nor being able to hold a copyright, the proposition was made that the Association be invited to join the three societies in the publication of a new edition, in which the title "The New York and Brooklyn Formulary" was to be dropped, and the Association was to assume the control of the work. The Association should have the right to give it any title it pleased, and to control that. We only offered to share the copyright with the Association, provided the Association thought proper that it should be copyrighted at all, the object being merely to insure the recovery of the expense of the publication, and to prevent its being reprinted by unauthorized parties.

Now the Council stated to the representative that it was unable to entertain the proposition, as it had no authority to act in the premises, and that the subject must be brought before the Association.

Now in order to bring it before the Association, we have drawn up this circular, which was printed and distributed yesterday to save time, and you all have been able to read the arguments presented there. I do not mean to say that we wish to offer arguments by which we might hope to persuade you to take that book. We shall be very glad to take our offer back again if the gift is not accepted. We can make a very good use of it. We know it is only a skeleton, which can be greatly improved and enlarged. We are well aware that it is not perfect. The Association, if it takes hold of it, will be able to obtain co-laborers all over the country, and perhaps make something much better of it. It is not a book rising to the dignity of the Pharmacopœia. Formulæ which are to go into it may possibly have a place in the Pharmacopœia sometime; its chief object, however, is to produce uniformity in many unofficinal preparations about which there is much disagreement.

Now the proposition of the Committee was, first, that the Association approve of the Formulæ and express its willingness to adopt it, under such conditions as it may please to make. Understand, that while we are not bound and obliged to accept these particular conditions, we are bound for the present to such conditions as will insure to us, the present holders of the copyright, the control of the latter, up to the moment that you as an Association are going to publish it. But if you, even at the very last moment, should decide that your committee is not able to publish it, then we would like to take back the copyright, and again own it ourselves, just as if we had never released it. But if we are assured that you are going to accept the work, we will be perfectly willing to give up the copyright. We did not publish the book to make any money out of it, but merely to help the profession. This much in reference to the first proposition contained in the circular—distributed yesterday, and emanating from the New York and Brooklyn Committee.

The second proposition then is that, if you publish it, we offer you the protection of three incorporated societies; and it is certainly more natural for us to name our own societies rather than to select others, in order to protect this copyright. That is, our three societies propose to take you under our wing, provided you want to share the copyright. The Association alone, not being incorporated, cannot copyright anything. An individual member of your Association can copyright it, or individual officers can copyright it, but not the Association.

The third proposition is that we will turn over to you all the documents we have already on hand for the new edition. The fourth is that you appoint a Committee to publish a new edition of it, with such amendments as may be deemed advisable. How you shall appoint that Committee is entirely at your own discretion. Possibly it may be wise to appoint a committee in such a manner that its members can hold frequent meetings, without great inconvenience. Nor need you confine yourself to one section of the country. Put a committee at work in one part of the country at one time, and after some years you may appoint another committee in another section. And if you appropriate sufficient funds to carry it out in this way, the money will all come back again through the sale of the book. That is the preliminary report I have to make.

The Committee of the New and Brooklyn Formulary has submitted this Circular, and the Committee of the Association have endorsed it and offer it as their own.

MR. COLCORD.—As the chairman of the Committee on Unofficinal Formulas two years ago, I brought this subject up in this Association, believing that a National Formulary could be prepared by this body, and that it would be adopted by the various State Associations. The State Association of Massachusetts, at my suggestion, appointed a committee, and several other State Associations already have adopted this New York and Brooklyn Formulary, and have thus carried forward the good work. We endeavored to cover the country, and found it could not be done in the way we supposed. At your last meeting a new committee was appointed to report upon various formulas, including this New York and Brooklyn Formulary. I believe it can be of use to us all as pharmacists, and we can do a great deal of work if it is adopted by this Association. Various Associations will adopt it, as our State Association proposes to do, and they expect to see it accepted by all physicians of the State, which will give it, if adopted by this Association, a semi official standing second only to the Pharmacopœia. I believe the Association should adopt that Formulary, and that every pharmacist in the country will be benefited by it.

MR. EBERT.—I would like to ask the gentlemen of the Committee whether they are willing to allow this Association the privilege of printing their Formulary in the Proceedings of our Association.

MR. RICE.—While I am not directly authorized to answer that question by saying yes, I believe that there will be no objection made if we think it wise to print the Formulary in the Proceedings. I submit my opinion, and I believe it is the opinion of some of the other members present of the Committee, that it would not be wise to thus print this Formulary in the Proceedings. This Formulary is to go into the hands of physicians particularly, and they may not like to pay five dollars for a volume of the Proceedings for that purpose. You will have to strike off copies for general use anyhow, and for that purpose you ought to have a small pamphlet. This pamphlet which we have costs about forty five cents a copy, and is sold at fifty cents. You may have a large number printed. I would not advise to publish it in the Proceedings.

MR. EBERT.—Mr. President, that is just the point. We do not want as an Association to go into the publishing business. If the committee on this Formulary will allow us to publish it in our Proceedings, we will accept it as a part of the unofficinal formulas adopted by this Association. The New York and Brooklyn Publishing Committee can publish just as many of these books as they please, and no doubt there will be a great demand for them; but at the same time some may be willing to buy the Proceedings at five dollars apiece, with these formulas as reported. This would then be the basis for a set of unofficinal formulas. Then if the New York and Brooklyn Formulary Committee want to revise their work they can at the same time adopt those formulas which we bring forward from year to year and add them to their book and sell it. I do not want to see this Association going into book publishing, or owning a copyright. If they are willing to give us these formulas so that we can publish them for reference, and give them to those who are members, and to those who wish to buy the Proceedings, no doubt those who have gone into the business of publishing the smaller book will still be able to sell it, and to make some money out of it. I hope this Association will not try to do it.

MR. MENNINGER.—I think my friend Ebert does not quite understand the object of the motion. It does not aim to make this Association go into the book publishing business—for the matter of that, we do publish a book every year, and a very valuable one —but it is for the purpose of securing uniformity in these unofficinal formulas throughout the land, and I know of no way in which that can be done better than by the sanction of this Association; in no way can the medical profession throughout the land be reached more rapidly than by the separate publication of such formulas. We want to educate the medical profession, as it were, up to this standard. They will take a formula endorsed by a representative body in preference to one in connection with which there is a mysterious secrecy and a proprietary label. These societies are not particularly interested, locally or selfishly, in the distribution of this little book. After much labor, it is offered in order to get it adopted throughout the whole country. Thi formulary, with what additions this Association may make to it, is not for the purpose of giving the New York and Brooklyn Societies the privilege of having something with the names of the Associations attached to it; on the contrary, this committee, which has given a great deal of disinterested labor, and is composed of the best men in the profession, makes a very liberal offer to this Association.

MR. RICE.—I do not believe that the committee is authorized immediately to answer the question proposed by Mr. Ebert, but I would submit to you that I do not think that we have asked the Association to go into the book publishing business. We made a tender of the book which we have gotten up after two years of hard work. We could not do better work if we were asked to serve you further as a committee on unofficinal formulæ. We now offer you this work with all the labor done on it, but there are improvements necessary here and there. We do not want a cent of money for ourselves, and we have not put any money into our pockets by the sale of it. I do not like to have cold water thrown on it in this way. We do not ask the Association to go into the book publishing business. We ask you to accept the work, and you can, if you will, publish it in pamphlet form. We do not ask you to copyright it, but we offer to help you to copyright it if you choose to do so. At present I have nothing more to say on the subject. I would prefer to consult with my colleagues. It is very little encouragement the committee has received so far.

Mr. Ebert.—I do not at all reflect upon the formulary, or object to it; on the contrary, I think that a great advantage would result to the societies from the acceptance of their book, and from its publication in the Proceedings as the accepted formulary of this Association. What I am opposed to is that this Association shall publish anything else than its annual Proceedings. If these formulas go into the Proceedings, that gives them a weight which they would not otherwise have. They might be marked approved by the American Pharmaceutical Association, be published in pamphlet form, and scattered all over the country. If the formulary committee will say that this book belongs to us, we will publish it in small pocket form, so that all physicians and all druggists who want it in that form can buy it. I do not see what difference it will make. I do object to this Association taking it and going into the book publishing business. The place for it is in the Proceedings, and nowhere else.

Mr. Paddock.—The gentleman from Chicago would like to supply about fifteen hundred druggists of the United States these formulas, and then let us publish an edition of fifteen hundred copies more and keep them. He would supply in the Proceedings an element in the profession which care for this book. We can then labor to improve and to enlarge this work, and republish it, while the members of this general committee of fifteen gentlemen in New York and Brooklyn have bestowed two years' labor upon this work, furnished their own material for all experiments at their own cost, and have not been reimbursed. They have had the backing of their societies, but the individuals have not got back their money, which they have disbursed for the materials, and they have no compensation for the labor bestowed. Now you are so very magnanimous, you will make whatever use you choose of this, and you say, do what you can with what remains. I for one shall object.

Mr. Seabury.—I think, Mr. President, that this question is one which ought to bring up considerable discussion, because it does not revolve upon the point of the mere profession of pharmacy at all. I think that these formulas, if adopted, will, so to speak, bring us out of our commercial troubles. Where these formulas have been generally adopted in localities where we find commercial grievances, they have had that effect. These formulas are the result of a good deal of honest and enthusiastic labor, and have not only been adopted in New York and Brooklyn, but in many other localities. Some of the States have adopted them, and the question naturally comes to this point: Shall we nationalize this Formulary, and from time to time add to it, so that every pharmacist in the United States shall have the Formulary of Unofficinal Preparations that are manufactured almost by every other druggist in the country, and become a uniform standard.? I think the great mistake that has been made in this matter of formulas is that they have not invited into their meetings a committee from the State medical local associations. I think if they had done that, a great deal of labor would have been performed through the medical societies which would have made a report in relation to these formulas. I believe the Constitution of this Association provides for pharmaceutical progress not only in preparations but in its literature. I do not see why the American Pharmaceutical Association cannot adopt a National Formulary, just as we can adopt anything else which is of advantage to us. I fail to see the difference between an excellent paper and an excellent series of formulas. The time is suitable, and I think that this Association will be put on its trial, not only on this question of a National Formulary—the publication and other questions. It will resolve itself into this: Whether we shall become a purely scientific body with a name, or whether we shall adjust ourselves according to the Constitution of this Association? We have thirty thousand druggists in this country, and we have seventy-five thousand physicians in this country; now I think this is a matter for the Associations of this country to at least rise and become the mouth-piece, and not spend nearly all the time that we have on questions that are not of national importance. It does not become this Association to quietly cast them aside, simply because when the Association was small we naturally had small ideas. The Association is growing into considerable proportions—entirely out of proportions in fact—and we have got to learn to try to precipitate some of the obsolete notions to which we are hanging like a drowning man that grasps at a straw. It is to the progressive element that the Association to-day owes its progress, and whatever questions of national importance come up we should give them proper attention. I fail to see how it would hurt; it would add to our prosperity and dignity to have a national standard of formulas, and I am only astonished that such a standard has not been adopted before. This is an important question, and one of value to pharmacy. You must not lose sight of it. Other States are coming into line, and they will be asked to do something by and by. Within the next five or six years we are going to have more colleges, more young men to teach; and then the question of getting butter to put on our bread will be put more closely than we have ever had it put before. I say this question revolves not only on the inside of the mortar, but on the outside, by which I mean we will get a better National Formulary, and we will do a great deal towards making the bread a little thicker and the butter a great deal better.

Mr. Remington.—I arise now to a question of business. We have yielded three times, and I believe the last minute even by Pittsburgh time is gone. I, therefore, move that this subject be deferred, and that the regular business be proceeded with.

The motion was seconded and adopted.

Mr. Sheppard read a paper by Mr. Patch, on "Pills of Potassium Permanganate" (see page 459), in answer to Query 82.

Vice-President Hollister occupied the chair.

Mr. Sloan.—Mr. Chairman, I would like to say a few words on the topic of incorporating permanganate of potash with simple cerate. I have here a sample of pills that have been made as long as a year. They show the pure red color of the permanganate on the addition of a drop of water. I would be glad if any gentleman would take out one of those pills, mash it, and then put a drop of water to it, to see what the effect is. It is a simple excipient, and is always at hand. I have tried resin cerate first, and had no unpleasant results. I have also used petrolatum, thinking it would work better; but I suggest the use of simple cerate, and I know that physicians accept the results.

Mr. Remington.—I have used the kaolin process with water as suggested by Proctort of England, for making pills of permanganate of potassium. The difficulty about this method lies in the trouble in making a plastic mass. It should be united with some fatty substance like resin cerate or cacao butter. This will answer very well for the purpose of making a pill, but I submit on philosophical grounds, that it is useless for us to institute experiments to ascertain the excipients which produce the least deoxidation, when the pill itself comes in contact with organic substances in large excess the moment it reaches the stomach, and a salt of manganese is produced having totally different properties. I think if pharmacists can do anything to influence physicians to discourage the use of these pills, they should do so.

Mr. Markoe.—We all know the first action of organic matter on permanganate of potassium is to reduce it to hydrate of manganese. This subject came up in the Norfolk District Pharmaceutical Society. The physicians complained a great deal of the gastric irritation which was produced by the use of permanganate of potassium, and the question was referred to me for an opinion; and I told them that no matter how well the pill might be made, and how skilfully protected, the consequence would be decomposition on reaching the stomach: first by reacting upon the food, and second upon the stomach itself, if the proportion of permanganate was large and more than sufficient for the food. That has been thoroughly proved by experience in taking such pills with not much food in the stomach. Then I suggested, and the idea seemed to be satisfactory to the physicians—it is certainly true chemically—that the secondary or useful effect of permanganate of potassium was undoubtedly due to the gradual absorption of the hydrate of manganese which is produced in the stomach. It would seem to me that the administration of carbonate or hydrate—recently prepared hydrate or carbonate of manganese—would undoubtedly be as good as the administration of the permanganate of potash.

MR. KLIE.—I believe that permanganate of potassium is one of those chemicals for which we should not use an excipient in making it into pills. I am very much in favor of compression as a general method for making pills. I believe that permanganate of potassium is one of those chemicals where compression can be used very well, and such pills remain intact a long time.

MR. BEDFORD.—I would not like to take those pills myself.

MR. FINLAY.—I have had some experience in making permanganate of potassium pills, and use Venice turpentine.

MR. PAINTER.—Venice turpentine would appear to me to be an oxidizing agent, and to make the oxidation rapid. I know from experience that wax does very well, because pills having been made up with wax have had a good effect. Three grain pills were prescribed, and they all came back again very promptly. The patient took another pill, and the stomach was acted upon by the permanganate of potassium when there was nothing on the stomach.

MR. BEDFORD.—Just another word. We happen to know of some cases in New York where the permanganate of potassium was ordered in a gelatin capsule, and the man came near having his stomach eaten out.

MR. REMINGTON.—This is an interesting subject, for we are all more or less interested in the compounding of permaganate of potassium pills. I believe that the physicians and patients are much safer if an excipient be used which has a slow action. While I do not believe in permanganate of potassium at all, if it is used I think its use should be guarded, and we should be very careful how we introduce a large quantity of caustic substance into the stomach.

MR. MENNINGER.—The remark of Mr. Painter, about using wax as an excipient leads me to suggest that an excipient with a somewhat higher melting point than that of wax would be desirable; the pill would then go safely through the patient, without being dissolved.

Mr. Sheppard read a paper by Mr. Patch, "On Pills of Nitrate of Silver" (see p. 460), in answer to Query No. 86.

MR. SLOAN.—I would make one suggestion in reference to making nitrate of silver pills, and that is that a steel spatula should not be used, which would reduce the salt at once.

MR. PRESCOTT.—In regard to pills of silver nitrate, and of potassium permanganate, I think that we should not forget that it is the business of pharmacists to comply with the intention of the physician as far as possible. It is certainly better that these salts should be diluted, and that they should not be allowed to suffer decomposition. Such materials as petrolatum are serviceable. The remarks made in regard to permanganate of potassium are very interesting, and would perhaps be more interesting to our medical friends; but I do not think they have suffered much annoyance, because permanganate of potassium is generally decomposed in the stomach, and soon loses its caustic power, for the most part. Physicians are in danger of this, that they sometimes prescribe medicines, such as nitrate of silver and permanganate of potassium, and they are put up with excipients causing decomposition, and the patient realizes little effect. So they increase the dose, until some pharmacist fills the prescription with use of excipients *not* causing decomposition of the active salt, and then the patient suffers irritation of the stomach or other unfavorable results. I think that we should endeavor to avoid this variability, and prevent all decomposition as far as responsibility for it rests on the pharmacist.

Mr. Feil read a volunteer paper entitled "Quinine in Elixir," which was accepted and referred (see page 453), and Mr. Diehl read the introductory portion of the Report on the Progress of Pharmacy (see page 25).

The papers on "Assaying Tincture of Opium," one by Mr. W. W. Bartlet (see page 446), and another by Mr. E. L. Patch (see page 448), were read, the latter by Mr. Sheppard.

MR. MARKOE.—I want to say a word in regard to the process recommended by Mr. Bartlet. I have had during about twenty years some experience in the manufacture of laudanum, using hot water in making it from the crude opium, which is the way manufacturers do. This manner, I think, is more satisfactory and more economical than by using powdered opium. I believe in the prolonged application of heat, not only using hot water, but I boil the opium fifteen minutes in hot water. I do not think it will do any practical harm; at all events continued application of heat will be beneficial and preferable to simply macerating the drug in hot water. A very good practical point is to express the drug, then use the percolator and let the expressed liquids percolate with the alcohol. This will save time, when large quantities of laudanum are to be manufactured.

MR. REMINGTON.—I cannot agree with what Mr. Markoe has said upon this subject: I think it is a bad practice to use heat. I know the manufacturers of morphine salts are very careful in the application of prolonged heat during evaporation, and I think that we ought to be very careful indeed not to exceed the directions of the Pharmacopœia in this respect. No one knows exactly what amount of damage heat will do to a solution of opium. Until this is definitely known, I think it would be unsafe to use heat in the preparation of tincture of opium.

MR. BARTLET.—I found that 100° Centigrade was a dangerous point to employ in the assay of opium, and I think for this reason that such a heat would be injurious in the manufacture of tincture of opium. You will notice in my paper that 85° Centigrade is the highest temperature recommended, and I was very careful to maintain that temperature. Some of the Pharmacopœias recommend in the assay of the tincture of opium a much higher temperature, but I was convinced by my experiments that this is wrong. In making the tincture you may heat the water to boiling, but you will find that before it goes into the vessel and comes in contact with the opium you wish to exhaust, the temperature will immediately fall so much so that it will be no longer boiling water; hence the use of boiling water in the manner stated does not conflict with my experience. Another matter Professor Patch suggests is the uniformity of the opium—that it should always be adjusted to 14 per cent. of morphine. If that could be done it would be most desirable, but I think that it is almost impossible; for on using powdered opium which had been thoroughly dried and mixed as thoroughly as possible, I found different samples of this powdered opium to vary slightly in morphine strength; and it seems to me that it would be absolutely impossible for pharmacists to correctly adjust powdered opium. Better leave it as it is, using opium containing from 12 to 15 per cent. of morphine; it is a very easy matter to properly adjust laudanum, it being a liquid.

MR. MARKOE.—I don't wish to be understood as in any way advocating the application of prolonged heat to opium. I agree with the remarks made by Mr. Remington, but you must remember I was not speaking of applying heat with assaying. Every precaution should be taken to prevent decomposition by the application of heat. My remarks were intended to apply to the treatment of opium when breaking it down, and I maintain that in this way you gain time and do not injure the opium. If you use very hot water you can break the opium down in a very short time, and the saving of time is a matter of importance in making several gallons.

MR. ELIEL.—I would like Mr. Bartlet to explain how it is possible that opium could contain a greater quantity of morphine than the tincture made from it.

MR. BARTLET.—I do not quite understand what you said.

MR. SHEPPARD.—I think I understand the gentleman's question. The difference is an error caused by the manipulation. It is a very close error, which is shown in Professor Patch's paper. Any one who has assayed opium knows that it is almost impossible to get the morphine strength absolute; you are just as liable to get it a little higher as lower.

MR. BARTLET.—I made opium to assay 12 per cent. morphine strength; made into laudanum, this would not assay 1.20 per cent.

MR. PRESCOTT.—How much loss will occur?

MR. BARTLET.—Between one and two one-hundredths.

MR. PRESCOTT.—About one per cent.

MR. SHEPPARD.—I do not think that there is any such loss, by using great care. We may refer to the papers.

MR. PRESCOTT.—We understand that Professor Patch's experiments refer to an exceptional course of examinations by the Pharmacopœia process. I wish to know what would be likely to occur in the hands of ordinary pharmacists, who took no special care to do this work nicely.

MR. SHEPPARD.—This occurred when Mr. Patch was making laudanum for use in his own store, and it was not for a special purpose.

MR. MARKOE.—Professor Prescott undoubtedly wishes to ascertain what would be the average result obtained by using the ordinary implements of his store, and having no better scales, say, than the Becker or the Tromner prescription scale, that is not sensitive to the twentieth milligram. The ordinary pharmacist does not expect to get such results, nor does he expect to get much better than the first or second decimal.

MR. SHEPPARD.—I would like to read Mr. Patch's results for laudanum made with opium containing 14 per cent. of morphine; they are 13.9, 13.26, 14, 13.66, and 14.2 per cent., which is very close.

MR. BARTLET.—I made one or two assays like this. For one I took 13 per cent. opium, and this came out about 1.12 or 1.125 per cent. of morphine in the tincture. That will be about the difference—very close indeed.

MR. SHEPPARD.—This is a well-known subject in which apothecaries are getting to be interested. I have carefully looked over these papers of Messrs. Bartlet and Patch, and I think they are excellent papers: one supplements the other. Mr. Bartlet makes one remarkably good point, I think; he uses crude opium, and gets a strong preparation which is brought down to the proper strength, which they both admit to be wise—to make 14 per cent. strength, instead of permitting a range of from 12 to 16 per cent. Prof. Patch makes a very good point in this way: many apothecaries think it is a troublesome thing to assay opium; Prof. Patch does not. He says use the Pharmacopœial process, and then he gives minute directions with great exactness—a uniform process which we can all thoroughly understand. He shows that the Pharmacopœial process with modifications here and there will give good resuls.

MR. OLDBERG.—It is rather startling to hear one say that we should use scales that are more sensitive than we do. I think the opium itself should be assayed within the limit of from 12 to 16 per cent., and when this has been done, it should be used in making the preparations set down in the Pharmacopœia. Granted the Pharmacopœia did not go far enough, but certainly it can make little difference whether the tincture is from the crude opium or the powdered opium. It must not be expected that pharmacists will enter into scientific processes constantly. The pharmacist makes laudanum very frequently and very economically by the use of powdered opium that has already been assayed; taking the correctness of the assay for granted, the result will be sufficiently accurate. But there are other causes of error besides those caused by scales and by a difference in manipulation. I have had the privilege of seeing a paper which will be presented at this meeting, and have had the pleasure of listening to Prof. Lloyd, and am convinced that other errors in assaying alkaloidal products are likely to occur quite as serious as those caused by inaccurate scales.

MR. BARTLET.—I would like to explain why we in Massachusetts are very anxious to talk a great deal about powdered opium and tincture of opium. The adulteration act of Massachusetts has made the U. S. Pharmacopœia the law. If we would make the tincture of opium from opium which assays to 12 per cent. of morphine, and the law was strictly enforced, we would be likely to be put in jail. It is, therefore, a very important subject, and the papers which have been read upon it, instead of altering the Pharmacopœia in any way, simply aim to explain how the various details of assaying shall be properly applied so as to bring out a definite result.

MR. HALLBERG.—I think it would be better for pharmacists to purchase a uniformly standardized powdered opium from which to make their preparations. This attempt of assaying and standardizing pharmaceutical preparations is all very well in theory, but unfortunately it does not work in practice. We all know how a galenical preparation is made. These preparations are called for in a hurry. Are you going to wait until your tincture of opium is assayed? There are very few who will do so. The only practical way for at least 90% of the pharmacists in Massachusetts and anywhere else to do is to make their opium from a uniform powder. It is the only way by which any degree of uniformity in the tincture can be maintained.

Mr. Bartlet.—In Massachusetts we are compelled to go by the law; the preparations are to be of Pharmacopœial standard.

Mr. Markoe.—My friend Mr. Bartlet is scaring you a little bit. I do not think that any jury in Massachusetts would convict, or any chemist in Massachusetts would be fool enough to prosecute, on the margin of one-tenth of one per cent. Furthermore, I must say that the Pharmacopœia does not expect pharmacists to be assayists. Pharmacy is not chemistry. If the pharmacist uses fair opium within a half of one per cent., he does good practical work.

Mr. Hallberg.—This standard, I believe, has been established a few years ago, and I have not heard that any one has been put into jail.

Mr. Prescott.—With regard to the Pharmacopœial process of assaying opium, I think that those men giving the greatest attention to the subject in this country will quite accept the criticism made by the English chemist, in his trial of the U. S. Ph. process, reported in the "Pharmaceutical Journal," that its deficiency lies in taking too small a quantity of the filtrate—that is, taking it by measure instead of by weight. Fifty grams instead of fifty centimetres should be taken, this being about fifty-three cubic centimetres, I believe. This correction will perhaps be made if the process stands in our next revision. In the meantime, although we might not be authorized to do that now, it might be taken into consideration in assays under legal requirements. As regards the practical bearing of the method of assaying of the opium upon the standard of laudanum strength, the question is of some importance, because laudanum is being tested in different States, and pharmacists are being held accountable, in their good name if not in law. I cannot interpret the Pharmacopœia to strictly hold or require the tincture of opium to contain 1.2 per cent. of morphine. The Pharmacopœia does not say so. It is an assumption that laudanum is always made of opium without any waste of morphine; and the Pharmacopœia does not lay down a limit of waste, how much it may be or how little. It would be an arbitrary construction of the law that should assume a loss to be impossible in making laudanum with ordinary care. Furthermore, so long as there are dealers in pharmacy who habitually make laudanum with weight of crude moist opium instead of dry opium, and others who reduce the quantity to one-half that of the legal strength, there is sufficient field for execution of the law without raising questions upon margins of one- or two tenths per cent.

Mr. Good.—Inasmuch as 12% of morphine strength is the minimum recognized by the Pharmacopœia, I do not think the apothecary is justifiable in marching so close to the line, and in the classes which I teach I always insist that we should use an opium containing 14% of morphine; the Pharmacopœia, which merely gauges the opium, justifies me in fixing that as the standard. While I admire Prof. Bartlet's process, it would not be put into practical use by druggists. I think that the plan spoken of by Prof. Oldberg is the better one, and that it should be insisted upon that opium should contain 14% of morphine. I would also like to call attention to the fact that the officinal tincture of opium is very far inferior to the deodorized tincture. I think that we are not doing our duty when we do not call the attention of physicians to the superiority of this preparation. We can then discard the present officinal tincture altogether, in favor of the deodorized tincture.

Mr. Markoe.—For external use the tincture of opium should be retained.

Mr. Good.—Perhaps it will be well; but I will insist that we do not do our duty if we do not call the attention of physicians to the superiority of other preparations for internal use.

MR. OLDBERG.—I have been in the habit of recommending 13% as the correct percentage of morphine in opium to be used for tinctures.

THE SECRETARY.—Just one more word in relation to what was said by Prof. Good. He spoke about the superiority for internal use of deodorized tincture of opium over laudanum. I agree with that perfectly, and I ask the question, "Is that superiority not due to a very large extent to the fact that most pharmacists make the ordinary tincture with crude opium?" Compare a tincture made with crude undried opium with a tincture made out of opium after it has been carefully dried and powdered, and you will find a very marked difference between the two, especially in the odor.

MR. MARKOE.—That from the dried and powdered opium would have a much better odor.

MR. OLDBERG.—I may be excused for adding my reason for recommending 13% of the opium; most opium will average that, and the men who make the tincture without assaying will in nine out of ten cases strike that figure.

MR. SHEPPARD.—I would like to ask Prof. Maisch if he means that there is a difference in the strength of the laudanum made in the two ways.

THE SECRETARY.—I mean in character. When the powdered opium is used, the heavy odor of the crude drug has been to a considerable extent expelled in drying and the tincture prepared from it is far less odorous, although it is not deodorized as in the other case, where treatment with ether has been resorted to.

The Secretary read the following telegram, which was received at Pittsburgh, Pa., at 11.40 a. m.:*

BRAEMAR, *September* 10, 1885.
TO THE AMERICAN PHARMACEUTICAL ASSOCIATION, PITTSBURGH, PA.
British Pharmaceutical Conference heartily reciprocate kind greetings.
J. B. STEPHENSON, *President.*

Mr. Sheppard now read a paper by Mr. Lloyd, entitled "Precipitates in Fluid Extracts" (see page 411), which was accepted and referred.

MR. HALLBERG.—I would like to add the suggestion to that paper as to whether we should look for an explanation of the peculiar phenomena to physical laws which we do not know yet, or to chemical laws. It seems to me that in Experiment No. 7, with bisulphate of quinine, that owing to the rapid crystallization of the sulphate after the paper was extracted, the crystallization must have been due to the formation of the basic salt of quinine by the withdrawal of a portion of the sulphuric acid by the paper fibre. If this is the cause, it is really a chemical decomposition which has taken place, which I would like to have explained, if possible.

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* Sometime after the adjournment of the meeting a letter was received from Mr. S. Plowman, Hon. Gen. Secretary Brit. Phar. Conf., stating that the message sent from Pittsburgh did not arrive until 5.20 p. m., on September 9th, and after the business of the Conference had terminated; and that the members did not come together again until the luncheon on the excursion day (10th), when the message was read and received with enthusiasm. A delay of 24 hours was thus caused in the reply.—PERMANENT SECRETARY.

MR. LLOYD.—In reply to Mr. Hallberg, I would say that we cannot wholly separate physical and chemical laws. I think that they merge into each other more nearly than we at present anticipate. There is no doubt that paper will decompose certain chemical solutions; in this instance bisulphate of quinine was decomposed, and the salt formed was the less soluble sulphate, sulphuric acid having been abstracted. If you will remember, I called attention to the necessity in determining the quinine by precipitation with carbazotate of ammonium, of previously using enough sulphuric acid to redissolve the crystals in order to arrive at accurate results. We will find on close observation that many of our strong chemical compounds can be decomposed in a similar manner.

MR. OLDBERG.—That is precisely what I referred to when I made the remark about the paper—that it would throw light on the fact that filtering will not only extract quinine from solutions, but will also break up the alkaloidal salt.

MR. ROSENWASSER.—This depends upon the structure of the paper. These salts are more or less soluble, and the paper takes up a certain quantity according to the amount of water absorbed; that is the reason why varying results are obtained.

MR. PRESCOTT.—I wish to say a word on this subject. I think this series of papers has been of great value. This is, I believe, the third year in which the Association has received a paper from Prof. Lloyd on this subject. I think it is a notable example of the fact that true research is reported from the field of applied science as well as that of pure science. The reflection is often cast upon us by those engaged in pure science, that we appropriate the results of investigations made in pure science, giving little credit for them unless they bear upon the industries of life. The public at large reap the benefits, they say, while those engaged in the investigations get little reward. While that is true, it is equally true that those who are engaged upon investigations in pure science often fail to give credit for the benefits directly due to the workers in applied sciences. Now, it is not true that those who serve the public in technical pursuits contribute nothing to the advance of science in general. As an example, Prof. Lloyd says he commenced his investigations to avoid certain difficulties in practical work, and he has opened up a field which is of the utmost importance in pure molecular science. It has been asked whether we should refer Prof. Lloyd's results to chemical action within molecules, or to those forces between molecules which may be classed under physical action. Now, we do not know a great deal about these two modes of force, or their essential nature; but I think we know this much, that there is no sharp line of demarcation between the chemical action within the molecules and the physical action between the molecules. They grade off into each other. We must look out for the interference of adhesion in a great many operations called chemical. The interference of adhesion is a cause of error very many times when we do not look for it. Now take this matter of opium assay. We use a stated quantity of the filtrate as an aliquot part of the entire liquid. If the adhesive power of the filter is sufficient to absorb and hold certain dissolved substances of the liquid, then your filtrate may not fairly represent the entire liquid, or the entire material which has been in the liquid form. The question should arise in every similar operation, whether a separation of materials may occur by adhesion. Perhaps, as the gentleman says, it does occur to a greater extent when the solid material is cellular, but we know very well that unorganized solids, such as the precipitate of aluminum hydrate, absorb dissolved solids to a very inconvenient extent. We know that we have to wash and wash in order to remove certain freely soluble salts from the precipitate. We very often have to wash three or four times more than we should need to do if there were no adhesions, and we had only to attain the requisite dilution of the salts of the filtrate. I am glad to know that this series of investigations is attracting the attention of men devoted to physical science, as well as of pharmacists, and is bringing attention to phenomena which have been passed by with too little attention.

Mr. Eccles read a volunteer paper entitled "Infected Solutions" (see page 429), which was accepted and referred. On motion of Mr. Hallberg, the thanks of the Association were tendered to Mr. Eccles for the great amount of labor bestowed upon this important subject.

In connection with this subject, Mr. Lloyd read also a short "Note on the Fungoid Growth in Dilute Phosphoric Acid," by Mr. L. E. Sayre (see page 446), which was accepted and referred.

MR. BROWN.—I am very much interested in this subject. I think, however, there is a great deal of poetry in it, not accompanied by a good array of facts. In the commencement of Dr. Eccles' paper, the poisonous nature of drugs is mentioned, and that with all drugs entering the system there is danger of being poisoned. I do not know about that. We are dealing with a practical matter. We know that in a great many aqueous solutions a vegetable growth takes place, probably through the dissolved material. Those who are familiar with the subject will tell us that certain solutions seem to decompose much more rapidly than others. Such a growth has also been seen in cinnamon water and peppermint water, and it is surprising how long solutions will be kept upon the shelves by druggists in the country while this vegetable growth takes place. Pharmacists recognize the fact that this is caused by the germs which are found everywhere, and that nowhere is the atmosphere or water without these germs. When after the boiling of water and after evaporation by steam, the healthy germs of bacteria or bacilli, or whatever they may be determined to be, could be found, we would know that they will resist such influences. Whether the growth that takes place in phosphoric acid really destroys the acid, is a question; but I am not inclined to believe that these living organisms find their support and their maintenance of life from such solutions. If such be the case, then the solutions must become deteriorated, and cannot be identical with the solutions made up originally. I want to call your attention to a case in which a solution of sulphate of morphine was used by hypodermic injection, being injected by a physician into a small vein; the presumption is that this living organism, being a ferment, entered the system, and in less than five hours the person died of pyæmia or of blood poisoning. Solutions of this kind should be prepared fresh if possible. The water for hypodermic injections should be freshly boiled, because we know that these organisms are then destroyed, and no harm can result from the injection. Often we find patients who declare that it is impossible to drink the ordinary water, owing to something that nauseates them. By boiling the water and cooling it properly, they get something acceptable to the stomach. This question comes before the drug trade, and it is important for the druggist to be well posted in regard to the remedy.

MR. PAINTER.—I would like to ask if the gentleman has experimented with sensitive alkaloids, and if he could tell us whether the alkaloid was injured by the growth.

MR. ECCLES.—The test was not made strictly as to the alkaloidal strength; but it was made by placing the solutions in U tubes. Operating in this way, there is no trouble to collect and recognize carbonic acid and other gases, which would be given off in case decomposition should take place. As to the chemical composition of the growth in phosphoric acid, I will say that it does not contain phosphates, and this excludes the possibility of its having anything to do with the decomposition of the acid. The acid was assayed before and after the experiment, and there was no decrease in strength.

On motion of Mr. Bedford, the Association adjourned until Friday morning at 9 o'clock.

FOURTH SESSION—FRIDAY MORNING, SEPTEMBER 11TH.

President Roberts having called the meeting to order, the Secretary read the minutes of the third session, which were approved.

Mr. Kennedy read the minutes of the third session of the Council (7 members present), which were likewise approved. These minutes give the following information:

The following five candidates for membership, reported at the third session of the Association, were duly elected:

Frederick Arthur Beckett, San Francisco, Cal.; Benjamin E. Pritchard, McKeesport, Pa.; Edward Newton Smith, Thompsonville, Conn.; William H. Cotton, Newport, R. I.; Albert M. Todd, Nottawa, Mich.

The applications of two candidates were examined and ordered to be reported to the Association.

On motion of J. M. Maisch, the Council resolved that there was no necessity for making an appropriation from the general fund of $500, since the interest from the Centennial Fund was available for this purpose.

The Secretary read the following report:

PITTSBURGH, PA., *September* 11, 1885.

TO THE AMERICAN PHARMACEUTICAL ASSOCIATION.

We would respectfully recommend that the next annual meeting of this Association be held in the city of Providence, Rhode Island, on the second Tuesday of September, 1886.

W. S. THOMPSON,
S. A. D. SHEPPARD,
G. W. SLOAN.
Committee on Time and Place of Meeting.

The report was accepted, and, pending Mr. Menninger's motion for adoption, Mr. Hallberg spoke in favor of holding the next meeting in Detroit, and Mr. Ebert in favor of San Francisco. Mr. Painter moved to amend the report by substituting San Francisco for Providence, and Mr. Allen further moved to substitute Detroit. Both amendments were lost.

Mr. Good moved to amend the report by substituting the first Tuesday (seventh day) for the second Tuesday (fourteenth day) of September next. This was carried, and the report as amended was adopted.

The following was read:

The Committee on Time and Place of Meeting offer the following motion: That Mr. G. W. Sloan be appointed a committee to ascertain the views of the members of this Association as to the best time of meeting, and report at the next annual meeting.

The resolution was adopted.

Mr. Painter offered the following:

Resolved, That at the next annual meeting of this Association no acts of the Council or Entertainment Committee shall interfere with the Association holding its sessions morning, afternoon and evening of the second day of the Convention.

The motion was seconded, and Mr. Day offered the following as a substitute, which was adopted:

Resolved, That at future meetings of the American Pharmaceutical Association, there shall be two sessions held daily until all business of the body is disposed of.

On motion of the Secretary a committee of five was appointed by the chair to visit the National Wholesale Drug Association at its next meeting in Philadelphia. The chair appointed Messrs. Chas. A. Heinitsh, Lancaster, Pa.; Chas. Caspari, jr., Baltimore; James T. Shinn, Philadelphia; Chas. Bullock, Philadelphia, and Jos. L. Lemberger, Lebanon, Pa.

Mr. Ebert made the following motion, and called upon Mr. Rice for further explanations:

WHEREAS, Our Committee on Unofficinal Formulæ report that the several pharmaceutical bodies under whose auspices the "New York and Brooklyn Formulary" has been published, have signified their willingness, without remuneration, and for the benefit of the profession at large, to surrender to the American Pharmaceutical Association all interest in said Formulary; therefore,

Resolved, That the American Pharmaceutical Association accept and publish the same in the forthcoming Proceedings with its approval and endorsement, and that its Committee on Unofficinal Formulæ be directed to continue and complete the revised edition of the Formulary now well under way, with a view to making it national in its character; and,

Resolved, That said revision, when completed, be published by the American Pharmaceutical Association in such form as to place it within easy reach of all pharmacists.

MR. RICE.—Mr. President: Certainly yesterday it appeared to me that there was a peculiar reluctance to accept the gift freely offered; but I am happy to say that reluctance, due to a misunderstanding, has been overcome. This may have occurred in reading the report hastily. We had, in substance, offered you the following terms: We have asked you to approve of the Formulary, provided you thought it worthy. That was the proposition, or, perhaps, merely a suggestion on the part of the Committee. Then the other proposition was put in the form of an invitation from the New York and Brooklyn Societies, asking the Association to join in the copyright. We did not insist that you should copyright it; we offered it to you and wanted to help you in the matter of getting the copyright, as we are incorporated. If you favored our suggestions you could take our book and take our copyright. Or if you did not want it copyrighted, and are rich enough to put your hand into your pocket and pay for its publication without insuring to yourselves the exclusive sale of it, you could go ahead and do it. The nex tproposition was that we ask you—actually ask you—to take all the work that had been done in the preparation of the third edition, which we interrupted in order to make you this offer. We did not ask you to appoint us a Committee. As a Committee, you can appoint anybody else. We are very willing to turn over all our papers to this Committee. We knew that some money was required to carry on the experiments, and we suggested that you place some funds at the disposal of the Committee. You need not do this if the members of the Committee are all rich men, and are willing to pay the expense themselves. But you could not expect everybody to do that, and serve upon the Committee. If this Committee is going to correspond with the State Pharmaceutical Associations in all parts of the United States, to find out what formulas each one desires to have introduced, with a view of making them uniform, there will be some expense. In view of the fact that all this work would cost something, we suggested that you set aside for the use of the Committee two hundred and fifty dollars.

It should not be forgotten that a previous Committee made an official request of our General Committee to let them have the New York and Brooklyn Formulary, in order to incorporate it in their report to this Association, because they could not get up anything better. We made the reply that we were not authorized at the time to turn over the book; but as the work has now advanced so far in our hands, we concluded to give it to the Association in order to make it national. We sent a representative to Philadelphia to see the Council, and the Council seemed to be satisfied with the offer at that time, so far as they understood it; but they decided that they were not authorized to accept it, or to act in the premises, and the advice then given us, was to come to the Association. In response to that invitation, we make you a very liberal offer, and that is what was given to the Association yesterday. Yesterday the impression on my mind and on the minds of my colleagues was very strong that our offer was supposed to be not quite disinterested, and that for this reason cold water was thrown upon it. I am glad to sav that this was a misapprehension. The explanation made a little while ago is satisfactory, and the offer still stands without any reserve of any kind; and if you are ready to act upon it, we shall be perfectly satisfied.

Mr. Ebert's motion was unanimously adopted; likewise the motion made by Mr. Colcord, that last year's Committee on the Report of Unofficinal Formulas, viz: Chas. Rice, chairman; P. W. Bedford, W. P. De Forest, S. J. Bendiner, and A. Tsheppe, be the Committee on Unofficinal Formulas for the ensuing year.

Mr. Good moved a reconsideration of the vote upon Mr. Day's motion, which was passed this morning, the object of the reconsideration to be that entertainments at the annual meetings be not entirely postponed until after the close of the meeting. The motion was debated by Messrs. Kline, Painter, Sheppard and Day, when the previous question was called by Mr. De Forest, the vote resulting in 45 ayes and 15 nays. After some further debate upon the scope of the motions made by Mr. Painter and by Mr. Day, and without disposing of the subject, Mr. Thompson called for the regular order of business.

A paper on the "Exportation of American Drugs," by Mr. L. A. Haber, was read (see page 493). Mr. Menninger remarked that the paper gave evidence, not formerly possessed, that the exportation of American drugs had been increasing.

Mr. Markoe read the following

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Your Committee recommend that the first proposition, to abolish the initiation fee, be not adopted, but that it shall be merged with the Life Membership Fund, and set aside to form the nucleus of a permanent fund.

That whilst outlines of the courses of studies in the several branches of knowledge constituting a proper and sufficient pharmaceutical education would be useful, your Committee is unable to perceive how this preparation and publication could be advantageously undertaken by the Association.

The third recommendation of the President is warmly approved, *i. e.*, that employers shall exercise unremitting care in choosing the material for the future pharmacist by thoroughly examining each applicant who desires to enter the drug business, in the branches of an English education. This examination should at least embrace arithmetic as far as proportions, orthography, grammar, English composition, geography, and American history.

The final proposition of your retiring President is recommended, *i. e.*, that the proper test of fitness of a candidate for the license of a State Examining Board is the State examination.

George F. H. Markoe,
Joseph P. Remington,
Oscar Oldberg,
Committee.

The report was, on motion of Mr. Good, received, and the Committee discharged.

To carry out the first recommendation contained in the Committee's report, an amendment to Article IV. of the Constitution was offered by Messrs. Maisch and Ebert, as follows:

Add after the words, "received from," in first line, the words "entrance fees and," so as to make the Article read: All moneys received from entrance fees and life membership, together with such funds as may be bequeathed or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the annual interest of which only shall be used by the Association for its current expenses.

A motion made by the Secretary that the remaining recommendations of the Commitee on the President's Address be approved, was discussed by Messrs. Brown and Sheppard. Without deciding the question, the Association proceeded to the regular order of business.

Mr. Painter read a paper on "Oleate of Mercury" (see page 465).

Mr. Day.—If there is no discussion on the paper, I move that the motion of Mr. Maisch with reference to the adoption of the report on the President's address be adopted.

The motion to adopt the second, third, and fourth recommendations contained in the report of the Committee on the President's address was then carried.

Mr. Sloan.—Regarding this paper by Mr. Painter, on the oleate of mercury, I desire to say that I have used the process recommended by Mr. Oldberg, which is to precipitate a solution of nitrate of mercury with oleate of potassium in diluted alcoholic solution. Made according to the formula as given by Mr. Oldberg, a solution of 20% of oleate of mercury is obtained, which keeps well and may be readly diluted to 10%. It is a very suitable preparation, can be made in quantities to last for a number of months, and answers the purpose admirably.

Mr. Hallberg.—One word in regard to dilutions of oleate of mercury or other medicinal substances with petrolatum. This is very suitable as a vehicle, as far as my experience goes, and the experience of others supports that of Mr. Painter. Petrolatum makes a very acceptable ointment with substances that are not soluble. On the other hand, if we want to make an ointment of iodide of potassium, which salt is soluble in water, and which is not good until it is dissolved in water, then we have to use lard or some fat which can be decomposed, or form a chemical compound with the medicinal substance, and thus be absorbed by the pores.

MR. THOMPSON.—With regard to the oleate of mercury, troubles have been met with in making this preparation cold. If you use about 20 per cent. of ether, the mixture with the red oxide will be kept in a sufficiently fluid condition until the operation is finished, and then if exposed in an open vessel it can be stirred until the ether evaporates.

The Secretary read the following telegram:

SAN FRANCISCO, *September* 10, 1885.

TO THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Greetings from the tribe of the setting sun to the chiefs at their big pow-wow. Our wigwam is ready, and we will build a big camp-fire whenever the Grand Council shall meet here. WM. SEARBY.

The following report was read:

At a meeting of the Nominating Committee, holden this day, the following nominations were made:

For the Committee on the Drug Market.—Alexander H. Jones, of Philadelphia, Chairman; E. Waldo Cutler, of Boston; Mahlon N. Kline, of Philadelphia; Christian F. G. Meyer, of St. Louis; Louis Lehn, of New York.

For Local Secretary.—William B. Blanding, of Providence.

CHARLES A. TUFTS, *Chairman.*
JOSEPH W. COLCORD, *Secretary.*

Pittsburgh, September 11, 1885.

On motion of Mr. Menninger, the Secretary deposited an affirmative ballot for the nominees, and they were declared to be duly elected.*

The Secretary, at the request of the Local Secretary, read the following letter, which was received with applause:

PHILADELPHIA, 8TH MONTH 20TH, 1885.

Respected Friend, George A. Kelly: Being now in my 85th year, with very frail health, I have had to relinquish all attendance of Pharmaceutical meetings. I am the only one living that was present at the first *suggestion* of the Philadelphia College of Pharmacy in the spring of *1821*, and I believe we are the oldest College in the United States. We commenced with 68 original members, only 2 of whom are now living, each of them now over 90 years of age. I attended our first course of lectures in the winter of 1821 and 1822, with a class of only 31. Our annual classes now average about 350, with 147 graduates last spring. I was elected a member 5th Month 22, 1822; out of the first 100 members of our college, the two original ones and myself are the only ones now living. I worked very faithfully for 45 years to build up our institution, until my health gave way, when I resigned all my honors, having been Vice-President for 22 years, but still take great interest and pleasure in being a life member of the Philadelphia College of Pharmacy.

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* Mr. Jones declining to serve on the Committee on Drug Market, and Mr. Kline being prevented from making the required report at the next meeting, Mr. Lehn kindly consented to act again as Chairman, and with the approval of the President and the Chairman of Council, the Committee was constituted as follows: L. Lehn, New York, chairman; M. N. Kline, Philadelphia; E. W. Cutler, Boston; D. Myers, Cleveland; and C. F. G. Meyer, St. Louis, Secretary.

With much respect I am thy fellow associate in Pharmacy,

SAMUEL F. TROTH.

P. S.—This day sixty-nine years ago, I first put hand to the mortar and pestle, and when I had one-half a dozen of young men about me, always put up prescriptions for my wife and six children myself, and to this day, in my 85th year, I do the same; preparing myself most of the medicines I use, notwithstanding I have been out of business for more than one-fourth of a century. By this thee may see I am still attached to my profession. Respectfully, SAMUEL F. TROTH.

Mr. Painter offered the following resolution, which was passed without discussion:

Resolved, That the Committee on Entertainment be instructed not to make any arrangement that shall interfere with the afternoon sessions of the second and third days of the meeting in 1886.

Mr. Menninger read a paper by Mr. Bocking on "Elixir of Calisaya Bark" (see page 454).

Mr. Ebert presented the following:

Resolved, That the Committee on Unofficinal Formulas have the right to draw on the Centennial Fund for any necessary expenses in their work.

The Chair ruled that the resolution should be referred to the Council, and it was so disposed of.

A paper on "Diachylon Ointment" was read by Mr. Good (see page 461), and Mr. Sheppard read one on the same subject by Mr. Patch (see page 463).

MR. GOOD.—I was interested in Mr. Patch's paper, and although my paper is short, it is on a subject that I have thought a great deal about. I hoped from what Mr. Sheppard had said that a satisfactory ointment would be shown; but unfortunately it is quite an old sample, still I think it should not be condemned for being slightly rancid; it certainly has kept much better than most others I have seen. The two samples which I have are a month old, and have been carried about for a considerable time; while they were almost identical when first made, one made from petrolatum is just as good as when it was prepared, but the other has changed quite materially, and is quite rancid. The ointment made from petrolatum is perfumed with oil of lavender; my habit is to perfume with oil of rosemary. My other sample is now tough and stringy.

MR. MARKOE.—We all aim at making officinal preparations of good material; those ointments containing animal oils our physicians insist generally on having made fresh. Ointments made according to the U. S. Pharmacopœia, when fresh, leave nothing to be desired. I think it is unsafe to attempt to make this one keep two or three months.

Mr. Trimble read a paper "On the Volatile Oils of Peppermint and Spearmint" (see page 501), and stated that he had prepared pipmenthol from the oil properly rectified by submitting it to a temperature of —10°

C. or less; but that difficulty had been experienced in removing all the liquid portion from the crystals, thus raising their melting point. At the suggestion of Mr. Rice, Mr. Todd was invited to communicate to the meeting his experience.

Mr. Todd.—In reference to these volatile oils, Prof. Trimble told you, and you are aware, that Gladstone stated that he had obtained a hydrocarbon in oil of spearmint, but Prof. Trimble was unable to prepare it from the very light portion which I sent him. Upon investigating the matter, I came to the conclusion it was probably due to impurities contained in the oil examined by Mr. Gladstone. I am well aware of the care which Prof. Trimble bestowed on his experiments, and I know from personal knowledge that the utmost care was taken. It was stated that the oil of spearmint that Gladstone used was .910 specific gravity. I will say that there is no pure oil of spearmint that is less than .925 specific gravity at 60° F., so that the hydrocarbon that Gladstone got must have been from some adulterant, or weeds, such as *Erigeron canadense*, the oil of which is a proper terpene. All oil of spearmint contains more of the light portion in fractional distillation, more of the hydrocarbon, than the oil of peppermint. In distillation, the heavy portion is the portion which comes over last. In the fractional distillation of spearmint oil there is a greater difference between the specific gravities of its first and last fractions than between the first and last fractions of peppermint oil. In order to get a fraction approximating a pure hydrocarbon, it is necessary to have a large portion of oil to work with. The fraction secured for Mr. Trimble was obtained from 120 pounds; still the result looked for was not obtained. I think a more satisfactory result might be possibly obtained if 1000 pounds were used. I will state a few facts in reference to oil of peppermint, and its distillation in general: Neither the first portion obtained by fractional distillation, nor the extreme last fraction, contains pipmenthol, or at least does not indicate it at 8° F. No crystals are to be obtained in the last five per cent. or in the first five per cent. I wish to state here that the specific gravity of fresh natural oil of peppermint never varies so much as it is stated in the Dispensatories. There never was a pound of pure oil of peppermint to my knowledge—and I have been manufacturing for 17 years—that was below .905 specific gravity at 60° F., or above .920. Oil of peppermint may be above .920, in which case, however, it is resinified. Of the Japanese oil, the samples obtained for experiment run from .899 to .902, showing that it is a much lighter oil than the true peppermint of mentha piperita. I wish to state a queer fact in regard to the variations in specific gravity in the different portions obtained by fractional distillation. If I put a thousand pounds of oil of peppermint of about .915 sp. gr. in a refining cylinder, and force steam through it, at first very slowly, the first five per cent. coming over will have a specific gravity of about .880 instead of .915, as the crude oil in the cylinder is. The second will have a specific gravity of perhaps .890, so there is an increase of ten. The third fraction will not increase ten above the second, but perhaps eight; the fourth perhaps six, and the fifth about four—the ratio constantly lessening, until finally it is stationary. Now comes the interesting part: After about half has come over, the specific gravity of the succeeding fractions commences slowly to decrease in a constantly increasing ratio, until, when 75 or 80 per cent. have passed over, a very light portion is obtained a second time. It then commences very rapidly to rise, the extreme last portion being about .960. This seems very strange to me: I am unable at present to account for it. I repeated the experiment eight times, with the same result.

On motion of Mr. Markoe the thanks of the Association were tendered to Mr. Todd for the interesting remarks on the mint oils, and he was requested to prepare for the next meeting a paper embodying his further observations on the subject.

The following resolutions, offered by Mr. Sheppard and seconded by Mr. Markoe, were read and adopted:

Resolved, That the thanks of this Association are hereby due and tendered to George A. Kelly, Local Secretary, and to his co laborers, for the success attending this meeting.

Resolved, That our thanks are due and tendered to the Arrangement Committee, for the excellent arrangements made on our behalf.

Resolved, That our thanks are due and tendered to the drug trade and the citizens of Pittsburgh, for the hearty welcome extended to us during our stay in this city.

Resolved, That any papers not read be referred to the Committee on Publication.

Resolved, That when we adjourn, we adjourn to meet in the city of Providence on the first Tuesday in September, 1886.

Mr. Sheppard also presented the following resolution, which was passed:

Resolved, That the Local Secretary, Mr. William B. Blanding, be appointed chairman of the Committee of Arrangements, with authority to appoint four other gentlemen to act with him on that Committee.

Mr. Rice stated that he had learned that the concluding remarks of the report on the alleged sale of condemned drugs by the Government had been construed as implying misinformation on behalf of Mr. Heinitsh, when he referred to the subject in the President's annual address two years ago; and that recently definite data covering certain assertions by several journals had been brought to the notice of the Committee. Mr. Rice, therefore, requested that the Committee be permitted to bring forward a supplemental report in reference to these assertions. The request was granted.

Mr. Maisch gave a synopsis of his paper, on the "Purity of Commercial Spanish Saffron" (see page 504); and Mr. Rosenwasser read an abstract of a volunteer paper on "Percolation" (see p. 399). Both papers were accepted and referred.

The Chairman of the Committee on Papers and Queries, in compliance with the resolution previously passed, handed in the following papers, which were referred to the Committee on Publication.

Pharmaceutical Steam Boiler: Correction. By Edgar L. Patch (page 399).
Stick Potash of Commerce. By Edgar L. Patch (page 474).
Commercial Calomel. By Edgar L. Patch (page 476).
Glycerin of Commerce. By Edgar L. Patch (page 484).
Pharmaceutical Notes; by Henry T. Cummings (page 407).
On the Use of Fluid Extracts for making other Pharmaceutical Preparations; by O. A. Wall (page 419).
Our Abstracts; by V. Coblentz (page 424).
Coloring of Elixirs; by J. W. Caldwell (page 452).
Preservation of Mucilage of Acacia; by T. W. Watkins (page 458).
Menthol Cones of the market; by P. W. Bedford (page 470).
Imported Menthol; by P. W. Bedford (page 504).

Commercial Chloroform; by P. W. Bedford (page 492).
Calomel; by P. W. Bedford (page 477).
Stick Caustic Potash of Commerce; by E. Goebel (page 472).
Glycerin of Commerce; by E. Goebel (page 481).
Liquor Ferri Nitratis; by L. Dohme (page 475).
Black Antimony of Commerce: by R. B. Warder (page 479).
Tartar Emetic of Commerce; by R. B. Warder (page 430).
Glycerin of Commerce; by R. B. Warder (page 486).
Arctic Vegetation; by G. W. Kennedy (page 495).
Medical Properties of Two Rhamnus Barks; by G. W. Kennedy (497).
Dandelion and Chicory; by Joseph Feil (page 496).

The Secretary then read the minutes of the fourth session, which were approved, and afterward the Thirty-third Annual Meeting of the American Pharmaceutical Association was adjourned.

At the fourth and fifth sessions of the Council, held after the adjournment of the Association, September 11, 1885 (7 members present), the following business was transacted:

The two candidates reported to the Association at the last session were duly elected members:

Chas. Trask Inman, Akron, O.
W. H. Keck, Allegheny City, Pa.

A committee of three, consisting of Messrs. J. L. Lemberger, Jos. Roberts, and G. W. Kennedy, was appointed to consider and report upon a plan for reducing the expenses of the Association.

A committee of one, consisting of J. M. Maisch, was appointed to consider and report upon a plan for completely separating the business sessions from the scientific sessions of the Association.

The salary of the Reporter on the Progress of Pharmacy for the ensuing year was fixed at $750.

On the recommendation of the Committee on the Centennial Fund, an appropriation from that fund, not to exceed $100, was placed at the disposal of the Chairman of the Committee on Unofficinal Formulas, to defray the expenses of that committee.

On motion of Mr. Sheppard, it was resolved that the Council shall not meet during the interim between the annual meetings, except in cases of very urgent business; and not then, if the business can be transacted by correspondence.

JOHN M. MAISCH, *Permanent Secretary.*

Nearly all the visiting members had been provided with comfortable quarters at the Monongahela House, where, on the evening of September 8th, a reception was held in the parlors, and a microscopic soiree was tendered by the Iron City Microscopical Society, who had twenty-five or thirty microscopes in position. Besides a large number of slides and various accessories of the microscope, a number of micro-photographs of sections of plants, several so-called composite photographs, and other interesting subjects, were exhibited. Wednesday afternoon was set apart for visiting manufacturing establishments, the white glass works and cork factories being the attraction. In the evening an attractive musical entertainment was given at Lafayette Hall, followed by dancing until after midnight. On the following day, Thursday, September 10th, a steamboat excursion was had up the Monongahela river, including a visit to the Edgar Thompson Steel Works; the delay caused by the inspection of the many interesting processes going on at this establishment rendered it necessary to abandon the contemplated trip downward to the Ohio river. In the evening a large number of members and invited guests sat down to a banquet in the Monongahela House. After the final adjournment on Friday afternoon, a trip by railroad was made to the Plate Glass Factory, and subsequently to the Natrona Soda Works. At all the places mentioned, every attention was paid to the visitors, and all possible facilities were offered for inspecting the various processes.

Many of the members, on their homeward trip, spent Sunday at Deer Park, and extended their journey into Virginia, while others enjoyed a couple of days' rest at Cresson Springs, before proceeding to their homes.

APPENDIX.

NEW YORK AND BROOKLYN

FORMULARY OF UNOFFICINAL PREPARATIONS*

PUBLISHED

BY A JOINT COMMITTEE OF DELEGATES

FROM THE COLLEGE OF PHARMACY OF THE CITY OF
NEW YORK, THE NEW YORK GERMAN APOTHECARIES' SOCIETY, AND THE KINGS COUNTY
PHARMACEUTICAL SOCIETY.

INTRODUCTION.

To the Medical Profession:

THE favor which some of the preparations of the so-called "Elegant Pharmacy" have found with the medical profession during the past ten or fifteen years, has induced many manufacturers of Elixirs, Syrups, Emulsions, etc., etc., to vie with each other in the introduction of new combinations, or to imitate each other's products, as soon as any of the latter appeared to have acquired a ready sale. Quite commonly, each manufacturer claims for his particular products the distinction of "superiority of manufacture" and "purity of materials." The physician prescribes the several makers' products in turn, and thereby compels the pharmacist to provide himself with separate packages of each maker's preparations, many of which are left on his shelves after the first or second call, so that the collection finally represents quite a respectable investment, or rather a dead loss, since the articles deteriorate more or less rapidly, and cannot be sold in the market.

Recognizing the ephemeral character of such products, and relying upon further support on the part of the medical profession, the manufacturers keep on increasing the number of their preparations, and do not fail to present sample bottles of each to the physician, who, thereupon, frequently prescribes them, one by one, and thereby increases the pharmacist's dead stock—an everlasting reminder of poorly-invested capital. This practice then leads to another deplorable evil, namely to this, that the patient, knowing the names of the articles and of the manufacturer, will procure them subsequently on his own responsibility, at wholesale prices, without further reference to physician or pharmacist. These goods, also, induce unscrupulous and uneducated persons to play doctor, since the labels pretend to give all sorts of therapeutic information, recommending the contents in this or that disease, and specifying the doses to be administered.

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* The title of this Formulary has been allowed to remain as in the original, because this is a mere reprint of the pamphlet as offered to and accepted by the Association. The enlarged Formulary based on this, which will be submitted at the next meeting, will have the title: "National Formulary of Unofficinal Preparations."

THE EDITING COMMITTEE.

Naturally, this intolerable annoyance is sorely felt wherever it exists. It has been proscribed and publicly denounced by the representative pharmaceutical bodies of New York and Brooklyn, and Delegates from each were chosen over one year ago, to form a Joint Committee which should devise and publish practical formulas for such preparations of the so-called "Elegant Pharmacy" as appear to have established a claim to recognition, and have survived out of the endless number offered to the medical profession.

With this modest little work, which is herewith respectfully submitted, the Joint Committee offers to the physician and pharmacist of our sister cities the result of their thoughtful labor and skill—a result which has been reached only through a large number of experiments made especially for the purpose. The Joint Committee would respectfully request the medical fraternity to *abstain hereafter from designating the maker's name* of any preparation for which a formula is found in this pamphlet. Thus both physician and pharmacist will be sure to obtain uniform preparations, no matter where they may be dispensed.

New York, April 15th, 1884.

PREFACE.

It is safe to assert that the total amount of capital invested by pharmacists in so-called elegant preparations, bearing the labels of the various manufacturers, represents a very large sum; and it is evident to all that a large proportion of this lies idle, and may be unhesitatingly considered as dead loss. That many of the most frequently demanded preparations of this class have preserved their vitality and supposed reputation more by dint of energetic advertising than through any intrinsic merit, is likewise well known to all. Recognizing the necessity of doing something to try and alleviate the evil from which every member of the profession suffers, the three representative pharmaceutical bodies of New York and Brooklyn resolved, in the beginning of 1883, to appoint delegates to a Joint Committee which should publish a Formulary of Unofficinal Preparations, in order to enable pharmacists to prepare those which are in most frequent demand, after a uniform standard. This Formulary was to be afterwards submitted to the medical profession with an explanation of the reasons of its origin, and with a respectful request to make use of its contents or accept and approve the preparations contained therein, so far at least as to recognize them as being entitled to more confidence than those put on the market by the various manufacturers.

Accordingly, the several delegates were appointed, and the Joint Committee perfected its organization. Its first object was to ascertain what particular preparations appeared to be most frequently prescribed or called for in the cities of New York and Brooklyn, and in their vicinity.

Circulars were mailed to all the pharmacists of the two cities, requesting them to communicate the names or titles of those unofficinal preparations which were in most common demand in their respective neighborhoods, and for which it was desirable to have standard formulæ. At the same time the request was made that working formulæ for any of these preparations be submitted or communicated to the Joint Committee. But, perhaps owing to a misunderstanding of the objects and motives of the Committee on the part of the pharmacists addressed, the replies were quite limited in number, and the task of ascertaining and selecting the most frequently-used preparations was almost wholly left to the Committee.

A preliminary list having been drawn up, the Committee proceeded to determine, in a general way, the composition of the several preparations, so as to make them correspond. if possible, in strength as well as in general appearance, to those already in common use. In some cases, great discrepancy and uncertainty in this respect was found to prevail, and a fixed standard had to be established by the Committee itself. Each preparation was carefully studied, samples being prepared by the several members. These samples were examined and criticised at the meetings of the Committee, held at short intervals at the College of Pharmacy building, then set aside to test their keeping qualities, and subsequently either adopted or rejected.

In some cases, a final decision was not reached until a very large number of experiments had been made, and much material consumed.

It is believed that the formulæ finally arrived at, and which are given in this pamphlet, will yield fairly satisfactory preparations, provided the directions are properly followed.

In thus providing a guide for making these unofficinal preparations, the Committee had no desire or intention to trespass upon the field of therapeutics. Their object was, simply, to place at the disposal of the physician and pharmacist such formulæ as would be pharmaceutically correct and compatible, and, as nearly as possible, identical in strength with those available in commerce. Had the selection of the preparations depended solely upon the personal opinion of the members of the Committee as to their therapeutic value, the list would undoubtedly have been greatly curtailed.

A few explanatory remarks and suggestions may not be out of place here.

The formulæ have been so constructed that it will not be necessary to keep in stock a large number of compound preparations from which to make others. The principal standard preparations, however, which should always be kept on hand, are the following: Aromatic Spirit (No. 66), Simple Elixir (No. 46), Adjuvant Elixir (No. 1), Elixir of Cinchona (No. 13), Compound Elixir of Quinine (No. 43), Stronger Emulsion of Cod-Liver Oil (No. 53), and Compound Elixir of Taraxacum (No. 51), the latter not only for use in other preparations, but particularly as an excellent vehicle for *quinine*, in place of the many proprietary compounds to be found in the market.

Whenever, among the ingredients of a formula, a preparation is mentioned for which a working formula is given in this pamphlet, reference to it is made by placing after it its corresponding number.

All articles not thus distinguished are understood to be those officinal in the U. S. Ph. of 1880, or, if not officinal, to be of the highest commercial grade.

Special directions for filtration have only in a few instances been appended. At the risk of mentioning facts well known to every pharmacist, a few remarks on this subject may find room here.

In filtering many of the preparations quoted in this pamphlet, some difficulty will be encountered, owing to the density or viscidity of the liquid. Some liquids will slowly deposit a sediment; in the case of these, it will be found that filtration proceeds much more easily after they have been allowed to stand for some time. If they are required sooner, and filtration is to be hastened, a suitable quantity of phosphate of calcium may be added (provided the liquid contains no free acid), which is to be thoroughly incorporated, after which the mixture is to be poured into a well-wetted filter. The latter is best wetted with a mixture of alcohol and water, approaching in alcoholic strength that of the liquid to be filtered—provided it contains any alcohol at all. In most cases, however, water will answer equally well. In pouring the mixture into the filter, the latter should be filled as high as possible, so as to cause the deposition of solid particles in the pores of the paper, at once, over the whole available filtering surface. And on refilling the filter, the height to which it had been filled previously should not be exceeded. The first portions of the filtrate should be collected separately and returned to the filter, until the liquid comes through perfectly clear.

Aromatic or alcoholic liquids must be filtered in well-covered funnels.

A liquid may be so viscid that it will not easily run through the filter, or the filter may become so firmly adherent to the funnel that no liquid can pass except from its point. This drawback may be removed by placing between filter and funnel some contrivance or substance which will prevent direct contact. A moderately thin layer of clean tow around the sides, leaving the point of the filter clear, will be found a good expedient.

Should the formulæ here presented meet with approval, it may be presumed that a list of desirable additions will be suggested for insertion in a subsequent edition. In order to provide for this event, it is requested that all communications relating to proposed additions, as well as to improvements of the formulæ already published, be addressed to the College of Pharmacy of the City of New York, 209–211 East 23d street.

The members of the Committee have freely given much of their time, and have expended much valuable material. in order to accomplish the object for which they were appointed. Neither they, nor the Societies which they represent, have undertaken the publication of this pamphlet for the purpose of deriving any profit from it. At the same time it is right and proper that the expenses of the three Societies should be refunded, and, in order to accomplish this, the pamphlet is sold at a price which has been placed at as low a limit as possible. In order to protect their interests, the three Societies have joined in copyrighting the publication, intending thereby to prevent the reprinting of the same without their express authority, while permitting any one to make free use of the contents of the book, for the purpose of making the preparations contained therein. THE JOINT COMMITTEE.

NEW YORK, April 15, 1884.

The members of the Joint Committee are the following:

From the College of Pharmacy of the City of New York.—Peter W. Bedford, Chairman of the Joint Committee; Adolph Tscheppe, Samuel J. Bendiner, William H. Griffith and Julius Kalish.

From the New York German Apothecaries' Society.—Charles E. P. Meumann, Charles F. Schleussner, Secretary of the Joint Committee; Theodore Louis, Treasurer of the Joint Committee; Ernst A. Plath and Charles Rice.

From the Kings County Pharmaceutical Society.—William P. DeForest, Vice-Chairman of the Joint Committee; Louis E. Nicot, Edward A. Sayre, Donald L. Cameron and Charles R. Paddock.

EDITING COMMITTEE.

Charles Rice, Chairman; Peter W. Bedford, Samuel J. Bendiner, William DeForest and Charles F. Schleussner.

FORMULARY.

1.

ELIXIR ADJUVANS.

ADJUVANT ELIXIR.

Sweet Orange Peel	2 av. ounces.
Coriander	1 av. ounce.
Caraway	1 " "
Wild Cherry	4 av. ounces.
Glycyrrhiza, Russian, peeled	6½ " "
Alcohol, **Water,** each	a sufficient quantity.
Syrup, enough to make	1 gallon.

Grind the solids to a moderately coarse (No. 40) powder, and, having mixed *one* (1) *volume* of Alcohol with *two* (2) *volumes* of Water, moisten the powder with *four* (4) *fluidounces* of the mixture, and pack tightly in a percolator. Then gradually pour menstruum on top, until *eighty-eight* (88) *fluidounces* of percolate are obtained. Mix this with *forty* (40) *fluidounces* of Syrup, and filter.

2.

ELIXIR AMMONII BROMIDI.

ELIXIR OF BROMIDE OF AMMONIUM.

Bromide of Ammonium	640 grains.
Adjuvant Elixir (No. 1), enough to make	16 fluidounces.

Dissolve the Bromide of Ammonium in about *twelve* (12) *fluidounces* of Adjuvant Elixir, by agitation. Then add enough Adjuvant Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 5 grains of Bromide of Ammonium.

3.

ELIXIR AMMONII VALERIANATIS.

ELIXIR OF VALERIANATE OF AMMONIUM.

Valerianate of Ammonium	256 grains.
Chloroform	6 minims.
Tincture of Vanilla	2 fluidrachms.
Water of Ammonia	a sufficient quantity.
Tincture of Cudbear (No. 78)	2 fluidrachms.
Simple Elixir (No. 46), enough to make	16 fluidounces.

Dissolve the Valerianate of Ammonium in about *twelve* (12) *fluidounces* of Simple Elixir, in an open graduated vessel, and add enough Water of Ammonia, in drops, until a faint excess of ammonia is perceptible in the liquid. Then add the Chloroform, Tincture of Vanilla, and Tincture of Cudbear, and, finally, enough Simple Elixir to make *sixteen* (16) *fluidounces*.

Each fluidrachm contains 2 grains of Valerianate of Ammonium.

Note.—Should the odor of valerianic acid become perceptible after the Elixir has been kept for some time, it may be overcome by cautious supersaturation with Water of Ammonia.

4. ELIXIR ANISI.

Elixir of Anise.

(Aniseed Cordial.)

Oil of Anise, Saxony	25 minins.
Oil of Fennel Seed ("sweet")	5 "
Oil of Bitter Almond	1 drop.
Deodorized Alcohol	4 fluidounces.
Syrup	10 "
Water	2 "
Phosphate of Calcium	120 grains.

Mix the Oils with the Deodorized Alcohol, add the Syrup and Water, and set aside for twelve hours. Then mix the Elixir intimately with the Phosphate of Calcium, and filter through a well-wetted filter, returning the first portions of the filtrate until it runs through clear.

Note.—Oil of Star-anise, which is usually supplied by dealers when "Oil of Anise" without further specification is ordered, does not answer well for the above cordial. Russian Oil of Anise may be used, but the Saxony oil furnishes the finest product.

5. ELIXIR BISMUTHI.

Elixir of Bismuth.

Citrate of Bismuth and Ammonium	256 grains.
Boiling Water	1 fluidounce.
Water of Ammonia	a sufficient quantity.
Simple Elixir (No. 46), enough to make	16 fluidounces.

Dissolve the Citrate of Bismuth and Ammonium in the Boiling Water, and add enough Simple Elixir to make *sixteen* (16) *fluidounces*. When cold, add enough Water of Ammonia, in drops, to render the liquid slightly alkaline.

Each fluidrachm contains 2 grains of Citrate of Bismuth and Ammonium.

6. ELIXIR BUCHU.

Elixir of Buchu.

Fluid Extract of Buchu	2 fluidounces.
Fluid Extract of Triticum	1 fluidounce.
Tincture of Vanilla	1 fluidrachm.
Syrup of Coffee (No. 71)	6 fluidounces.
Carbonate of Magnesium	120 grains.
Simple Elixir (No. 46), enough to make	16 fluidounces.

Mix the liquids, and filter with the aid of the Carbonate of Magnesium.

7.

ELIXIR BUCHU COMPOSITUM.

Compound Elixir of Buchu.

Compound Fluid Extract of Buchu (No. 63)	2 fluidounces.
Simple Elixir (No. 46)	2 “
Compound Elixir of Taraxacum (No. 51)	12 “
Carbonate of Magnesium	120 grains.

Mix the liquids, and let the mixture stand during two hours. Then filter it with the aid of the Carbonate of Magnesium.

8.

ELIXIR CAFFEINÆ.

Elixir of Caffeine.

Caffeine	128 grains.
Citric Acid	32 “
Compound Elixir of Taraxacum (No. 51)	4 fluidounces.
Simple Elixir (No. 46), enough to make	16 “

Rub the Caffeine and Citric Acid in a mortar, with about *ten* (10) *fluidounces* of Simple Elixir, until solution is effected. Then add the Compound Elixir of Taraxacum, and enough Simple Elixir to make *sixteen* (16) *fluidounces.* Filter, if necesary.

Each fluidrachm contains 1 grain of Caffeine.

9.

ELIXIR CALCII BROMIDI.

Elixir of Bromide of Calcium.

Bromide of Calcium	640 grains.
Adjuvant Elixir (No. 1) enough to make	16 fluidounces.

Dissolve the Bromide of Calcium in about *twelve* (12) *fluidounces* of Adjuvant Elixir by agitation. Then add enough Adjuvant Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 5 grains of Bromide of Calcium.

10.

ELIXIR CALCII HYPOPHOSPHITIS.

Elixir of Hypophosphite of Calcium.

Hypophosphite of Calcium	256 grains.
Simple Elixir (No. 46), enough to make	16 fluidounces.

Dissolve the Hypophosphite of Calcium in *fourteen* (14) *fluidounces* of Simple Elixir, filter, and pass enough Simple Elixir through the filter to make *sixteen* (16) *fluidounces.*

Each fluidrachm contains 2 grains of Hypophosphite of Calcium.

11.

ELIXIR CALCII LACTOPHOSPHATIS.

Elixir of Lactophosphate of Calcium.

Lactate of Calcium	128 grains.
Phosphoric Acid (U. S. Ph. 1880: 50%)	128 minims.
Simple Elixir (No. 46), enough to make	16 fluidounces.

Rub the Lactate of Calcium with the Phosphoric Acid, and gradually with about *four* (4) *fluidounces* of Simple Elixir, until dissolved. Then add enough Simple Elixir to make *sixteen* (16) *fluidounces*. Filter, if necessary.

Each fluidrachm contains 1 grain of Lactate of Calcium, or about 1½ grains of so-called Lactophosphate of Calcium.

12.

ELIXIR CATHARTICUM COMPOSITUM.

Compound Cathartic Elixir.

Resin of Podophyllum	8 grains.
Resin of Leptandra ("Leptandrin")	16 "
Alcohol	½ fluidounce.
Fluid Extract of Senna	2 fluidounces.
Tartrate of Potassium and Sodium	2 av. ounces.
Bicarbonate of Sodium	120 grains.
Syrup	2 fluidounces.
Compound Elixir of Taraxacum (No. 51)	4 "
Elixir of Glycyrrhiza (No. 30), enough to make	16 "

Dissolve the Resins in the alcohol, and add the solution to the other liquids previously mixed, and in which the Tartrate of Potassium and Sodium and the Bicarbonate of Sodium have been dissolved.

The product should not be filtered, and should be shaken up before any portion of it is dispensed.

Note.—Average dose: two fluidrachms.

13.

ELIXIR CINCHONÆ.

Elixir of Cinchona.

(Elixir of Cinchona Bark; Elixir of Calisaya Bark.)

Tincture of Cinchona (U. S. Ph. 1880)	2½ fluidounces.
Aromatic Spirit (No. 66)	2 "
Syrup	6 "
Phosphate of Calcium	120 grains.
Water, enough to make	16 fluidounces.

Mix the liquids, allow the mixture to stand for twenty-four hours or longer, then incorporate the Phosphate of Calcium, and filter through a well-wetted filter, returning the first portions of the filtrate until it runs through clear.

Each fluidounce represents about 14 grains of Yellow Cinchona.

Note.—Compare No. 43: Elixir Quininæ Compositum.

14.

ELIXIR CINCHONÆ ET FERRI.

Elixir of Cinchona and Iron.

(Elixir of Calisaya and Iron; Ferrated Elixir of Cinchona.)

Phosphate of Iron (U. S. Ph. 1880)	256 grains.

Citric Acid	5	grains.
Boiling Water	1	fluidounce.
Compound Elixir of Quinine (No. 43), enough to make	16	“

Add the Phosphate of Iron and the Citric Acid to the Boiling Water, and dissolve. Then add enough Compound Elixir of Quinine to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 2 grains of Phosphate of Iron.

15. ELIXIR CINCHONÆ, FERRI, BISMUTHI ET STRYCHNINÆ.

Elixir of Cinchona, Iron, Bismuth, and Strychnine.

(Elixir of Calisaya, Iron, Bismuth, and Strychnine.)

Phosphate of Iron (U. S. Ph. 1880)	256	grains.
Citrate of Bismuth and Ammonium	128	“
Sulphate of Strychnine	2½	“
Boiling Water	1½	fluidounces.
Compound Elixir of Quinine (No. 43), enough to make	16	“

Add the Salts to the boiling water, and dissolve. Then add enough Compound Elixir of Quinine to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 2 grains of Phosphate of Iron, 1 grain of Citrate of Bismuth and Ammonium, and $\frac{1}{50}$ grain of Strychnine.

16. ELIXIR CINCHONÆ, FERRI ET BISMUTHI.

Elixir of Cinchona, Iron, and Bismuth.

(Elixir of Calisaya, Iron, and Bismuth.)

Phosphate of Iron (U. S. Ph. 1880)	256	grains.
Citrate of Bismuth and Ammonium	128	“
Boiling Water	1½	fluidounces.
Compound Elixir of Quinine (No. 43), enough to make	16	“

Add the Phosphate of Iron and the Citrate of Bismuth and Ammonium to the Boiling Water and dissolve. Then add enough Compound Elixir of Quinine to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 2 grains of Phosphate of Iron, and 1 grain of Citrate of Bismuth and Ammonium.

17. ELIXIR CINCHONÆ, FERRI ET CALCII LACTOPHOSPHATIS.

Elixir of Cinchona, Iron, and Lactophosphate of Calcium.

(Elixir of Calisaya, Iron, and Lactophosphate of Calcium.)

Phosphate of Iron (U. S. Ph. 1880)	128	grains.
Sulphate of Quinine	8	“
Sulphate of Cinchonine	4	“
Lactate of Calcium	64	“
Phosphoric Acid (U. S. Ph. 1880: 50%)	64	minims.
Water of Ammonia	½	fluidounce.
Citric Acid	120	grains.
Water	½	fluidounce.
Simple Elixir (No. 46), enough to make	16	fluidounces.

Dissolve the Phosphate of Iron in *one-half* (½) *fluidounce* of Boiling Water, add the solution, together with the Sulphates of Quinine and Cinchonine, to *seven and one-half* (7½) *fluidounces* of Simple Elixir, and shake until solution has been effected. Dissolve the Lactate of Calcium in *seven* (7) *fluidounces* of Simple Elixir with the aid of the Phosphoric Acid. Then mix the two solutions, add the Water of Ammonia, next the Citric Acid in powder, and shake. Finally, add enough Simple Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 1 grain of Phosphate of Iron and ½ grain of Lactate (or about 1½ grains of so-called Lactophosphate) of Calcium, with smaller quantities of Cinchona alkaloids.

18. ELIXIR CURASSAO.

Elixir of Curaçao.

(Curaçao Cordial.)

Spirit of Curaçao (No. 69)	120 minims.
Orris Root, powdered	30 grains.
Deodorized Alcohol	4 fluidounces.
Syrup	7 “
Carbonate of Magnesium	120 grains.
Water, enough to make	16 fluidounces.

Add the Spirit of Curaçao to the Deodorized Alcohol; then mix with the Syrup, and finally add enough Water to make *sixteen* (16) *fluidounces*. Now add the powdered Orris Root and set the mixture aside for forty-eight hours, occasionally agitating. Finally mix it intimately with the Carbonate of Magnesium, and filter through a well-wetted filter, returning the first portions of the filtrate until it runs through clear.

19. ELIXIR ERYTHROXYLI.

Elixir of Erythroxylon.

(Elixir of Coca.)

Fluid Extract of Erythroxylon	2 fluidounces.
Syrup of Coffee (No. 71)	2 “
Simple Elixir (No. 46), enough to make	16 “

Mix them.

20. ELIXIR EUCALYPTI.

Elixir of Eucalyptus.

Fluid Extract of Eucalyptus	2 fluidounces.
Compound Elixir of Taraxacum (No. 51)	7 “
Syrup of Coffee (see No. 71)	7 “
Carbonate of Magnesium	120 grains.

Mix the liquids and set the mixture aside for three days. Then filter it with the aid of the Carbonate of Magnesium.

21. ELIXIR EUONYMI.

Elixir of Euonymus.

(Elixir of Wahoo.)

Fluid Extract of Euonymus	2½	fluidounces.
Syrup of Coffee (No. 71)	2	"
Water	2	"
Compound Elixir of Taraxacum (No. 51), enough to make	16	"

Mix and filter.

22. ELIXIR FERRI HYPOPHOSPHITIS.

Elixir of Hypophosphite of Iron.

Solution of Hypophosphite of Iron (No. 65)	768 minims.
Simple Elixir (No. 46) enough to make	16 fluidounces.

Mix them.

Each fluidrachm contains 1 grain of Hypophosphite of Iron.

23. ELIXIR FERRI PHOSPHATIS, CINCHONIDINÆ ET STRYCHNINÆ.

Elixir of Phosphate of Iron, Cinchonidine, and Strychnine.

Phosphate of Iron (U. S. Ph. 1880)	256	grains.
Sulphate of Cinchonidine	128	"
Sulphate of Strychnine	2½	"
Aromatic Spirit (No. 66)	6	fluidounces.
Water	4	"
Syrup	6	"
Simple Elixir (No. 46), enough to make	16	"

Dissolve the Sulphate of Strychnine in the Aromatic Spirit, contained in a flask, add the Sulphate of Cinchonidine, place the flask into hot water, and shake it well occasionally. Dissolve the Phosphate of Iron in *four* (4) *fluidounces* of hot Water, in a capsule, add the Syrup, and heat nearly to the boiling point. Then pour this hot solution, all at once, into the flask containing the alkaloids in solution, and shake well immediately. When cold, add enough Simple Elixir, if necessary, to make *sixteen* (16) *fluidounces*, allow to stand for twenty-four hours, and filter.

Each fluidrachm contains 2 grains of Phosphate of Iron, 1 grain of Sulphate of Cinchonidine, and $\frac{1}{50}$ grain of Sulphate of Strychnine.

Note.—The Sulphate of Cinchonidine will all dissolve in the Aromatic Spirit when hot; on mixing the two hot solutions, they will become opaque at first, but will soon become almost or entirely clear. It is important that both solutions should be quite hot when mixed together.

24. ELIXIR FERRI PHOSPHATIS, QUININÆ ET STRYCHNINÆ.

ELIXIR OF PHOSPHATE OF IRON, QUININE, AND STRYCHNINE.

Phosphate of Iron (U. S. Ph. 1880)	256 grains.
Sulphate of Quinine	128 "
Sulphate of Strychnine	2½ "
Aromatic Spirit (No. 66)	6 fluidounces.
Water	4 "
Syrup	6 "
Simple Elixir (No. 46), enough to make	16 "

Dissolve the Sulphate of Strychnine in the Aromatic Spirit, contained in a flask, add the Sulphate of Quinine, place the flask into hot Water, and shake it well occasionally. Dissolve the Phosphate of Iron in *four* (4) *fluidounces* of hot Water in a capsule; add the Syrup, and heat nearly to the boiling point. Then pour this hot solution, all at once, into the flask containing the alkaloids in solution, and shake well immediately. When cold, add enough Simple Elixir, if necessary, to make *sixteen* (16) *fluidounces*, allow to stand for twenty-four hours, and filter.

Each fluidrachm contains 2 grains of Phosphate of Iron, 1 grain of Sulphate of Quinine, and $\frac{1}{50}$ grain of Sulphate of Strychnine.

NOTE.—The Sulphate of Quinine will not all dissolve in the Aromatic Spirit, but will be immediately dissolved as soon as the hot iron solution is poured in. It is important that both solutions should be quite hot when mixed together.

25. ELIXIR FERRI PYROPHOSPHATIS.

ELIXIR OF PYROPHOSPHATE OF IRON.

Pyrophosphate of Iron (U. S. Ph. 1880)	256 grains.
Water	2 fluidounces.
Tincture of Vanilla	1 fluidrachm.
Simple Elixir (No. 46), enough to make	16 fluidounces.

Dissolve the Pyrophosphate of Iron in *two* (2) *fluidounces* of hot Water, and add the solution to *twelve* (12) *fluidounces* of Simple Elixir. Then add the Tincture of Vanilla, and, finally, enough Simple Elixir to make *sixteen* (16) *fluidounces*.

Each fluidrachm contains 2 grains of Pyrophosphate of Iron.

26. ELIXIR FRANGULÆ.

ELIXIR OF FRANGULA.

Fluid Extract of Frangula	4 fluidounces.
Compound Elixir of Taraxacum (No. 51)	4 "
Simple Elixir (No. 46)	8 "

Mix them.

Each fluidrachm represents 15 grains of Frangula.

27. ELIXIR GENTIANÆ.

ELIXIR OF GENTIAN.

Extract of Gentian	70 grains.
Aromatic Spirit (No. 66)	3 fluidrachms.
Tincture of Vanilla	2 “
Syrup	1 fluidounce.
Simple Elixir (No. 46), enough to make	16 fluidounces.

Dissolve the Extract of Gentian in the Syrup by trituration, add the Tincture of Vanilla and the Aromatic Spirit, and enough Simple Elixir to make *sixteen* (16) *fluidounces*. Filter.

28. ELIXIR GENTIANÆ CUM TINCTURA FERRI CHLORIDI.

ELIXIR OF GENTIAN WITH TINCTURE OF CHLORIDE OF IRON.

Tincture of Citro-Chloride of Iron (No. 77)	640 minims.
Elixir of Gentian (No. 27), enough to make	16 fluidounces.

Mix them.

Each fluidrachm contains 5 minims of Tincture of Citro-Chloride of Iron.

29. ELIXIR GENTIANÆ FERRATUM.

FERRATED ELIXIR OF GENTIAN.

Phosphate of Iron (U. S. Ph. 1880)	128 grains.
Boiling Water	½ fluidounce.
Elixir of Gentian (No. 27), enough to make	16 fluidounces.

Add the Phosphate of Iron to the Boiling Water, and dissolve. Then add enough Elixir of Gentian to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 1 grain of Phosphate of Iron.

30. ELIXIR GLYCYRRHIZÆ.

ELIXIR OF GLYCYRRHIZA.

(Elixir of Liquorice.)

Fluid Extract of Glycyrrhiza	2 fluidounces.
Water of Ammonia	16 minims.
Simple Elixir (No. 46), enough to make	16 fluidounces.

Mix, and filter, if necessary.

31. ELIXIR GRINDELIÆ.

ELIXIR OF GRINDELIA.

Fluid Extract of Grindelia	1 fluidounce.
Aromatic Spirit (No. 66)	2 fluidounces.
Carbonate of Magnesium	120 grains.
Compound Elixir of Taraxacum (No. 51), enough to make	16 fluidounces.

Mix the liquids and filter with the aid of the Carbonate of Magnesium.

32.

ELIXIR GUARANÆ.

Elixir of Guarana.

Fluid Extract of Guarana	3 fluidounces.
Simple Elixir (No. 46)	3 “
Compound Elixir of Taraxacum (No. 51)	10 “

Mix, and filter, if necessary.

Each fluidrachm represents 11¼ grains of Guarana.

33.

ELIXIR HUMULI.

Elixir of Humulus.

(Elixir of Hops.)

Fluid Extract of Hops	2 fluidounces.
Tincture of Vanilla	1 fluidounce.
Compound Elixir of Taraxacum (No. 51)	2 fluidounces.
Carbonate of Magnesium	120 grains.
Simple Elixir (No. 46), enough to make	16 fluidounces.

Mix the liquids and let the mixture stand during two hours. Then filter it with the aid of the Carbonate of Magnesium.

34.

ELIXIR HYPOPHOSPHITUM COMPOSITUM.

Compound Elixir of Hypophosphites.

Hypophosphite of Calcium	128 grains.
Hypophosphite of Sodium	128 “
Hypophosphite of Potassium	64 “
Solution of Hypophosphite of Iron (No. 65)	384 minims.
Simple Elixir (No. 46), enough to make	16 fluidounces.

Dissolve the Hypophosphites in *fourteen* (14) *fluidounces* of Simple Elixir, by trituration in a mortar. Then add the Solution of Hypophosphite of Iron, finally enough Simple Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 1 grain, each, of Hypophosphite of Calcium and Sodium, and ½ grain, each, of Hypophosphite of Potassium and Iron.

35.

ELIXIR LITHI BROMIDI.

Elixir of Bromide of Lithium.

Bromide of Lithium	640 grains.
Adjuvant Elixir (No. 1), enough to make	16 fluidounces.

Dissolve the Bromide of Lithium in about *twelve* (12) *fluidounces* of Adjuvant Elixir, by agitation. Then add enough Adjuvant Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 5 grains of Bromide of Lithium.

36.

ELIXIR MALTI ET FERRI.

Elixir of Malt and Iron.

Extract of Malt	4	fluidounces.
Phosphate of Iron (U. S. Ph. 1880)	128	grains.
Water	½	fluidounce.
Simple Elixir (No. 46), enough to make	16	fluidounces.

Dissolve the Phosphate of Iron in *one-half* (½) *fluidounce* of Boiling Water, mix the solution with the Extract of Malt previously introduced into a graduated bottle, and add enough Simple Elixir to make *sixteen* (16) *fluidounces*. Set the mixture aside for twenty-four hours, then filter.

37.

ELIXIR PEPSINI.

Elixir of Pepsin.

Pepsin, in scales	128	grains.
Lactic Acid	30	minins.
Syrup	6	fluidounces.
Alcohol	4	"
Compound Elixir of Taraxacum (No. 51)	1	fluidounce.
Water, enough to make.	16	fluidounces.

Agitate the Pepsin with *three* (3) *fluidounces* of Water and the Lactic Acid, until it is dissolved. Then add the Syrup, Compound Elixir of Taraxacum, and the Alcohol, and finally enough Water to make *sixteen* (16) *fluidounces*.

Each fluidrachm contains 1 grain of scaled Pepsin.

38.

ELIXIR PEPSINI ET BISMUTHI.

Elixir of Pepsin and Bismuth.

Pepsin, in scales	128	grains.
Citrate of Bismuth and Ammonium	256	"
Alcohol	4	fluidounces.
Syrup	6	"
Compound Elixir of Taraxacum (No. 51)	1	fluidounce.
Water, enough to make	16	fluidounces.

Dissolve the Pepsin and the Citrate of Bismuth and Ammonium in *four* (4) *fluidounces* of Water, add the Syrup and Compound Elixir of Taraxacum, then add the Alcohol, and enough Water to make *sixteen* (16) *fluidounces*. Finally, filter.

Each fluidrachm contains 1 grain of scaled Pepsin and 2 grains of Citrate of Bismuth and Ammonium.

39. ELIXIR PEPSINI ET FERRI.

Elixir of Pepsin and Iron.

Pepsin, in scales	128 grains.
Lactic Acid	30 minims.
Phosphate of Iron (U. S. Ph. 1880)	256 grains.
Syrup	6 fluidounces.
Alcohol	4 "
Compound Elixir of Taraxacum (No. 51)	1 fluidounce.
Water, enough to make	16 fluidounces.

Agitate the Pepsin with *three* (3) *fluidounces* of Water and the Lactic Acid, until it is dissolved. Then dissolve in this the Phosphate of Iron, add the Syrup, Alcohol, Compound Elixir of Taraxacum, and afterwards enough Water to make *sixteen* (16) *fluidounces.* Finally, filter.

Each fluidrachm contains 1 grain of scaled Pepsin and 2 grains of Phosphate of Iron.

40. ELIXIR PHOSPHORI.

Elixir of Phosphorus.

Spirit of Phosphorus (No. 70)	30 fluidrachms.
Oil of Star-anise	16 minims.
Glycerin	9 fluidounces.
Simple Elixir (No. 46), enough to make	16 "

To the Spirit of Phosphorus add the Glycerin and Oil of Star-anise, and shake until they form a clear liquid. Then add the Simple Elixir, in small portions at a time, gently agitating after each addition, until a clear mixture results.

Each fluidrachm contains $\frac{1}{50}$ grain of Phosphorus.

41. ELIXIR PILOCARPI.

Elixir of Pilocarpus.

(Elixir of Jaborandi.)

Fluid Extract of Pilocarpus	2½ fluidounces.
Syrup of Coffee (No. 71)	3 "
Tincture of Vanilla	5 fluidrachms.
Compound Elixir of Taraxacum (No. 51), enough to make	16 fluidounces.

Mix them, let the mixture stand during four days, then filter.

Each fluidrachm represents about 9 grains of Pilocarpus.

42. ELIXIR POTASSII BROMIDI.

Elixir of Bromide of Potassium.

Bromide of Potassium	1280 grains.
Adjuvant Elixir (No. 1), enough to make	16 fluidounces.

Dissolve the Bromide of Potassium, reduced to powder, in about 12 fluidounces of Adjuvant Elixir by trituration in a mortar. Then add enough Adjuvant Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 10 grains of Bromide of Potassium.

43. ELIXIR QUININÆ COMPOSITUM.

COMPOUND ELIXIR OF QUININE.

(Elixir of Cinchona Alkaloids; Elixir of Calisaya Alkaloids.)

Sulphate of Quinine	16 grains.
Sulphate of Cinchonine	8 “
Simple Elixir (No. 46)	16 fluidounces.

Triturate the Sulphates of Quinine and Cinchonine with a portion of the Simple Elixir; then mix with the remainder and agitate until the salts are dissolved. Finally filter.

Each fluidounce contains 1 grain of Sulphate of Quinine and ½ grain of Sulphate of Cinchonine.

Note.—If it is desired to impart to this Elixir a brownish color, this may be effected by the addition of 10 minims of Caramel to each pint.—Compare: Elixir Cinchonæ No. 13).

44. ELIXIR RHAMNI PURSHIANÆ.

ELIXIR OF RHAMNUS PURSHIANA.

(Elixir of Cascara Sagrada.)

Fluid Extract of Rhamnus Purshiana	4 fluidounces.
Compound Elixir of Taraxacum (No. 51)	4 “
Simple Elixir	8 “

Mix them.

45. ELIXIR RUBI.

ELIXIR OF RUBUS.

(Elixir of Blackberry.)

Fluid Extract of Rubus (U. S. Ph.)	2 fluidounces.
Tincture of Vanilla	4 fluidrachms.
Compound Elixir of Taraxacum (No. 51)	4 fluidounces.
Simple Elixir (No. 46), enough to make	16 “

Mix them, and filter, if necessary.

46. ELIXIR SIMPLEX.

SIMPLE ELIXIR.

Aromatic Spirit (No. 66)	16 fluidounces.
Syrup	24 “
Water	24 “
Phosphate of Calcium	1 av. ounce.

Mix the liquids, adding the Water last; then mix thoroughly with the

Phosphate of Calcium, and filter through a well-wetted filter, returning the first portions of the filtrate until it runs through clear.

Note.—The specific gravity of Simple Elixir is 1.100.

If it is desired to impart to this Elixir a red color, this may be effected by the addition of 2 fluidrachms of Tincture of Cudbear (No. 78) to each pint.

47. ELIXIR SODII BROMIDI.

Elixir of Bromide of Sodium.

Bromide of Sodium	1280 grains.
Adjuvant Elixir (No. 1), enough to make	16 fluidounces.

Dissolve the Bromide of Sodium in about *twelve* (12) *fluidounces* of Adjuvant Elixir, by agitation. Then add enough Adjuvant Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 10 grains of Bromide of Sodium.

48. ELIXIR SODII HYPOPHOSPHITIS.

Elixir of Hypophosphite of Sodium.

Hypophosphite of Sodium	256 grains.
Simple Elixir (No. 46), enough to make	16 fluidounces.

Dissolve the Hypophosphite of Sodium in about *fourteen* (14) *fluidounces* of Simple Elixir, by trituration, in a mortar. Then add enough Simple Elixir to make *sixteen* (16) *fluidounces*, and filter.

Each fluidrachm contains 2 grains of Hypophosphite of Sodium.

49. ELIXIR STILLINGIÆ COMPOSITUM.

Compound Elixir of Stillingia.

Compound Fluid Extract of Stillingia (No. 64)	2	fluidounces.
Alcohol	2	"
Compound Elixir of Taraxacum (No. 51)	2	"
Simple Elixir (No. 46)	10	"

Mix them.

50. ELIXIR STRYCHNINÆ VALERIANATIS.

Elixir of Valerianate of Strychnine.

Strychnine	2½ grains.
Valerianic Acid	6 minims.
Tincture of Vanilla	2 fluidrachms.
Water of Ammonia	10 minims.
Tincture of Cudbear (No. 78)	2 fluidrachms.
Simple Elixir (No. 46), enough to make	16 fluidounces.

Rub the Strychnine with the Valerianic Acid, and about *four* (4) *fluidounces* of Simple Elixir until solution is effected. Then add the Water of Ammonia, being careful to avoid an excess; next the Tincture of Vanilla, Tincture of Cudbear, and enough Simple Elixir to make *sixteen* (16) *fluidounces.* Finally filter.

Each fluidrachm contains $\frac{1}{50}$ grain of Strychnine.

51. ELIXIR TARAXACI COMPOSITUM.

COMPOUND ELIXIR OF TARAXACUM.

Taraxacum	480	grains.
Wild Cherry	480	"
Sweet Orange Peel	480	"
Glycyrrhiza, Russian, Peeled	960	"
Cinnamon	120	"
Cardamom	120	"
Canada Snake Root	120	"
Caraway	120	"
Cloves	120	"
Pure Extract of Glycyrrhiza	60	"
Alcohol,		
Water	each, a sufficient quantity.	
Syrup	32	fluidounces.

Grind the solid substances to a moderately coarse (No. 40) powder, and percolate, in the usual manner, with a mixture of *one* (1) *volume* of Alcohol, and *two* (2) *volumes* of Water, until *sixteen* (16) *fluidounces* of percolate are obtained. In this dissolve the Extract, and, lastly, add the Syrup.

NOTE.—If a precipitate should make its appearance in the Elixir, on standing, it should be incorporated with the liquid by shaking, before use.

52. ELIXIR TURNERÆ.

ELIXIR OF TURNERA.

(Elixir of Damiana.)

Fluid Extract of Turnera (Damiana)	2½	fluidounces.
Alcohol	4	"
Glycerin	1	fluidounce.
Simple Elixir (No. 46), enough to make	16	fluidounces.

Mix and filter.

53. EMULSIO OLEI MORRHUÆ FORTIOR.

STRONGER EMULSION OF COD-LIVER OIL.

Acacia, in fine powder	2	av. ounces.
Sugar, in one powder	4	"
Cod-Liver Oil	16	fluidounces.
Water, enough to make	28	"

Mix the Acacia and Sugar with the Cod-Liver Oil in a dry mortar, and add *eight* (8) *fluidounces* of Water. Then triturate thoroughly and continuously, until the Oil is emulsified, and finally incorporate enough Water to make the product measure *twenty-eight* (28) *fluidounces*.

NOTE.—This is a Stock-Emulsion to be used for making the usual 50 per cent. Simple Emulsion of Cod-Liver Oil, or Compound Emulsions containing such additions as may be prescribed by the physician.

Instead of trituration in a mortar, mechanical means (such as a churn, egg-beater, etc.), may be employed for emulsifying the oil. Care should be taken not to suspend or interrupt the trituration or agitation until the emulsifying process is completed, since otherwise the emulsion will not be permanent.

It is advisable to keep this Stock-Emulsion in the bottles in which emulsions are usually dispensed, 7 fluidounces being put into an 8 ounce bottle, 14 fluidounces into a 16 ounce bottle, etc. When either a plain or compound emulsion is called for, it is completed by the addition of the required ingredients.

54. EMULSIO OLEI MORRHUÆ.

EMULSION OF COD-LIVER OIL.

Stronger Emulsion of Cod-Liver Oil, (No. 53)	14 fluidounces.
Oil of Sassafras	15 minims.
Oil of Wintergreen	15 "
Water, enough to make	16 fluidounces.

Mix them thoroughly.

55. EMULSIO OLEI MORRHUÆ CUM CALCII ET SODII HYPOPHOSPHITIBUS.

EMULSION OF COD-LIVER OIL WITH HYPOPHOSPITE OF CALCIUM AND SODIUM.

Stronger Emulsion of Cod-Liver Oil, (No. 53)	14 fluidounces.
Oil of Sassafras	15 minims.
Oil of Wintergreen	15 "
Hypophosphite of Calcium	64 grains.
Hypophosphite of Sodium	64 "
Water, enough to make	16 fluidounces.

Dissolve the Hypophosphites in *two* (2) *fluidounces* of Water, and add the solution to the Stronger Emulsion. Then add the Oils, and mix thoroughly.

56. EMULSIO OLEI MORRHUÆ CUM CALCII ET SODII PHOSPHATIBUS.

EMULSION OF COD-LIVER OIL WITH PHOSPHATE OF CALCIUM AND SODIUM.

Stronger Emulsion of Cod-Liver Oil, (No. 53)	14 fluidounces.
Oil of Sassafras	15 minims.
Oil of Wintergreen	15 "
Phosphate of Calcium	128 grains.
Phosphate of Sodium	128 "
Water, enough to make	16 fluidounces.

Dissolve the Phosphate of Sodium in *one and one-half* (1½) *fluidounces* of Water; then triturate the Phosphate of Calcium with this solution to a perfectly smooth paste, and add it to the Stronger Emulsion of Cod-Liver Oil contained in a bottle, using enough additional Water for rinsing the mortar, to make the product measure *sixteen* (16) *fluidounces.* Mix thoroughly.

57. EMULSIO OLEI MORRHUÆ CUM CALCII LACTOPHOSPHATE.

EMULSION OF COD-LIVER OIL WITH LACTOPHOSPHATE OF CALCIUM.

Stronger Emulsion of Cod-Liver Oil, (No. 53)	14 fluidounces.
Oil of Sassafras	15 minims.
Oil of Wintergreen	15 "
Lactate of Calcium	256 grains.
Phosphoric Acid, (U. S. Ph. 1880: 50%)	256 minims.
Water, enough to make	16 fluidounces.

Mix the Lactate of Calcium with *one* (1) *fluidounce* of Water and with the Phosphoric Acid, and, when solution has been effected, add enough Water to make the solution measure *two* (2) *fluidounces.* Add this, together with the Oils, to the Stronger Emulsion of Cod-Liver Oil, and mix thoroughly.

58. EMULSIO OLEI MORRHUÆ CUM CALCII PHOSPHATE.

EMULSION OF COD-LIVER OIL WITH PHOSPHATE OF CALCIUM.

Stronger Emulsion of Cod-Liver Oil, (No. 53)	14 fluidounces.
Oil of Sassafras	15 minims.
Oil of Wintergreen	15 "
Phosphate of Calcium	256 grains.
Water, enough to make	16 fluidounces.

Triturate the Phosphate of Calcium in a mortar, with *one* (1) *fluidounce* of Water to a perfectly smooth paste, and add this to the Stronger Emulsion of Cod-Liver Oil contained in a bottle, using enough additional Water for rinsing the mortar, to make the product measure *sixteen* (16) *fluidounces.* Mix thoroughly.

59. EMULSIO OLEI MORRHUÆ CUM HYPOPHOSPHITE.

EMULSION OF COD-LIVER OIL WITH HYPOPHOSPHITE.

Stronger Emulsion of Cod-Liver Oil, (No. 53)	14 fluidounces.
Oil of Sassafras	15 minims.
Oil of Wintergreen	15 "
Any Soluble Hypophosphite	128 grains.
Water, enough to make	16 fluidounces.

Dissolve the Hypophosphite in *two* (2) *fluidounces* of Water, and add the solution, together with the Oils, to the Stronger Emulsion of Cod-Liver Oil. Mix thoroughly.

60. EMULSIO OLEI MORRHUÆ CUM PRUNO VIRGINIANA.

Emulsion of Cod-Liver Oil with Wild Cherry.

Stronger Emulsion of Cod-Liver Oil, (No. 53)	14 fluidounces.
Oil of Bitter Almonds	4 minims.
Fluid Extract of Wild Cherry	1 fluidounce.
Glycerin	1 "

Mix the Fluid Extract of Wild Cherry with the Glycerin, add the mixture to the Stronger Emulsion of Cod-Liver Oil, and finally add the Oil of Bitter Almonds. Mix thoroughly.

61. EMULSIO OLEI RICINI.

Emulsion of Castor Oil.

Castor Oil	8 fluidounces.
Acacia, in fine powder	2 av. ounces.
Syrup	3 fluidounces.
Tincture of Vanilla	3 fluidrachms.
Water, enough to make	16 fluidounces.

Mix the Syrup with *three* (3) *fluidounces* of Water, and triturate the Acacia, in a mortar, with the mixture, to a smooth paste. Then gradually incorporate with it the Castor Oil. Transfer the mixture to a bottle, add the Tincture of Vanilla, and finally enough Water to make *sixteen* (16) *fluidounces*. Mix thoroughly.

Shake the mixture well before dispensing.

62. EMULSIO OLEI TEREBINTHINÆ.

Emulsion of Oil of Turpentine.

Oil of Turpentine	2 fluidrachms.
Acacia, in fine powder	30 grains.
Syrup	½ fluidounce.
Cinnamon Water, enough to make	2 fluidounces.

Pour the Oil of Turpentine into a two-ounce bottle, and, having corked it, agitate it so that the inside of the bottle may be completely wetted by the oil. Then add the Acacia, and shake again. Finally add the Syrup and enough Cinnamon Water to make *two* (2) *fluidounces*, and mix thoroughly by shaking.

63. EXTRACTUM BUCHU FLUIDUM COMPOSITUM.

Compound Fluid Extract of Buchu.

Buchu	8 av. ounces.
Cubeb	2 "
Juniper	2 "
Uva Ursi	2 "
Alcohol,	
Water	each, a sufficient quantity.

Reduce the solids to a moderately coarse (No. 40) powder, and, having mixed *two* (2) *volumes* of Alcohol with *one* (1) *volume* of Water, moisten the powder with *four* (4) *fluidounces* of the menstruum, and pack it tightly in a percolator. Then gradually pour menstruum on top, until the powder is exhausted. Reserve the first *fourteen* (14) *fluidounces* of the percolate, evaporate the remainder to *two* (2) *fluidounces*, and mix this with the reserved portion. Finally filter.

64. EXTRACTUM STILLINGIÆ FLUIDUM COMPOSITUM.

Compound Fluid Extract of Stillingia.

Stillingia	4 av. ounces.
Iris	4 "
Sambucus	2 "
Chimaphila	2 "
Coriander	1 av. ounce.
Xanthoxylum	1 "
Diluted Alcohol	a sufficient quantity.

Reduce the solids to a moderately coarse (No. 40) powder; moisten this with *four* (4) *fluidounces* of Diluted Alcohol, and pack it firmly in a percolator. Then pour Diluted Alcohol on top until the powder is exhausted. Reserve the first *fourteen* (14) *fluidounces* of the percolate, evaporate the remainder to *two* (2) *fluidounces*, and mix with the reserved portion. Finally filter.

65. LIQUOR FERRI HYPOPHOSPHITIS.

Solution of Hypophosphite of Iron.

Sulphate of Iron and Ammonium, (U. S. Ph.)	924 grains.
Hypophosphite of Sodium	608 "
Citrate of Potassium	600 "
Glycerin	1 fluidounce.
Water, enough to make	6 fluidounces.

Dissolve the Sulphate of Iron and Ammonium and the Hypophosphite of Sodium, each, in *eight* (8) *fluidounces* of Water, and, if necessary, filter the solutions separately. Then mix them; stir well; after a few minutes transfer the resulting magma to a close linen or muslin strainer, and wash the precipitate with a little water. Allow it to drain, and express it forcibly. Transfer the precipitate from the strainer to a mortar, add to it the Citrate of Potassium, and triturate until a perfectly smooth paste results. Then add the Glycerin, and gradually, while stirring, enough Water to make the product measure *six* (6) *fluidounces*. Filter, if necessary, and keep the Solution in small, well-corked vials, which should be completely filled.

Note.—The theoretical quantity of Hypophosphite of Iron resulting from the reaction between the ingredients above given is 480 grains, and, in practice, this is very closely obtained. *One* (1) *grain* of Hypophosphite of Iron is, therefore, contained in *six* (6) *minims* of the solution.

66. SPIRITUS AROMATICUS.

AROMATIC SPIRIT.

I.

Orange Peel, fresh and deprived of the inner, white portion	8 av. ounces.
Lemon Peel, fresh	2 " "
Coriander, bruised	2 " "
Oil of Staranise	16 minims.
Deodorized Alcohol, enough to make	1 gallon.

Macerate the solids during four days with *one* (1) *gallon* of Deodorized Alcohol; then add the Oil of Staranise, filter, and pass enough Deodorized Alcohol through the filter to make the product measure *one* (1) *gallon*.

II.

Aromatic Spirit may also be prepared as follows:

Compound Spirit of Orange, (No. 67)	8 fluidounces.
Deodorized Alcohol, enough to make	1 gallon.

Mix them.

Note.—Whenever practicable, the first of the above-mentioned formulæ should be followed. When the quantity of Aromatic Spirit to be prepared at one time is so large that it becomes inconvenient to separate the peel from fresh oranges and lemons, the second formula may be substituted.

67. SPIRITUS AURANTII COMPOSITUS.

COMPOUND SPIRIT OF ORANGE.

Oil of Bitter Orange Peel	4 fluidounces
Oil of Lemon	1 fluidounce.
Oil of Coriander	160 minims.
Oil of Staranise	40 "
Deodorized Alcohol, enough to make	20 fluidounces.

Mix them.

One (1) *fluidounce* of this solution and *fifteen* (15) *fluidounces* of Deodorized Alcohol make *one* (1) *pint* of Aromatic Spirit (II.).

Note.—Both the Oil of Orange and the Oil of Lemon must be absolutely free from terebinthinate odor and taste. Both oils should be procured only from the most reliable source, and, as soon as received, diluted with a definite quantity of Deodorized Alcohol, which will retard deterioration. Neither oil should be kept in stock for any length of time, or should at least be kept in bottles completely filled, and in a dark place. The same precautions ought to be observed with the alcoholic solutions. If Oil of Curaçao Orange can be obtained, it is advisable to use this, in place of ordinary Oil of Orange, as it imparts to the Spirit a much finer flavor than the latter.

68.

SPIRITUS CARDAMOMI COMPOSITUS.

Compound Spirit of Cardamom.

Oil of Cardamom	30 drops.
Oil of Caraway	10 “
Oil of Cinnamon, (Cassia)	4 “
Glycerin	2 fluidounces.
Alcohol	22 “
Water	18 “

Dissolve the Oils in the Alcohol, add the Glycerin, and finally the Water.

Note.—The above solution is to be used as a flavoring ingredient, being a substitute for the officinal *Tinctura Cardamomi Composita*, without the coloring matter.

69.

SPIRITUS CURASSAO.

Spirit of Curaçao.

Oil of Curaçao Orange	1 fluidounce.
Deodorized Alcohol	5 fluidounces.

Mix the Oil (which should be absolutely free from terebinthinate odor and taste) with the deodorized Alcohol, and keep the Spirit in a well-stopped bottle, in a dark place.

Note.—The Oil should be mixed with the Alcohol as soon as possible after it has been received. The Spirit will gradually deposit a whitish flocculent precipitate, from which the clear solution may be poured off after some time, or which may be separated by filtering the solution through purified cotton, or through paper, in a well-covered funnel.

70.

SPIRITUS PHOSPHORI.

Spirit of Phosphorus.

(Tincture of Phosphorus.)

Phosphorus	10 grains.
Absolute Alcohol, enough to make	15 fluidounces.

To the Absolute Alcohol, contained in a flask, add the Phosphorus (which should be in clean, transparent fragments), and dissolve it by applying the heat of a water-bath, taking care that the volume of Absolute Alcohol be preserved, as nearly as possible, until solution is effected. When cold, add enough Absolute Alcohol to make *fifteen* (15) *fluidounces*.

Keep the Spirit in a cool and dark place, remote from lights or fire.

Each fluidrachm contains $\frac{1}{12}$ grain of Phosphorus; 14.4 minims contain $\frac{1}{50}$ grain of Phosphorus.

Note.—The loss of Alcohol, during the heating, may be avoided, and solution effected more expeditiously, by attaching to the flask a well-cooled, upright condenser, which will cause the vapor of the Alcohol to be condensed, and to flow back into the flask.

71. SYRUPUS CAFFEÆ.

SYRUP OF COFFEE.

Coffee, roasted and finely ground	8 av. ounces.
Sugar	24 "
Boiling Water	a sufficient quantity.

Pour Boiling Water, in successive portions, upon the Coffee packed tightly in a percolator, until *sixteen* (16) *fluidounces* of percolate are obtained. In this dissolve the Sugar, by agitation, without heat.

NOTE.—It is recommended that a mixture of equal parts of the commercial varieties of Coffee, known as Mocha and Java, be employed for this preparation. The percolation should be conducted slowly, fresh portions of Boiling Water being poured on top, when the previous portion has disappeared from the surface, and the percolator should be covered during the operation.

72. SYRUPUS CALCII ET SODII HYPOPHOSPHITUM.

SYRUP OF HYPOPHOSPHITE OF CALCIUM AND SODIUM.

Hypophosphite of Calcium	256 grains.
Hypophosphite of Sodium	256 "
Sugar	12 av. ounces.
Water, enough to make	16 fluidounces.

Dissolve the Hypophosphites in *eight* (8) *fluidounces* of Cold Water, add the Sugar, dissolve it by agitation, filter, and add enough Water through the filter to make *sixteen* (16) *fluidounces.*

Each fluidrachm contains 2 grains, each, of Hypophosphite of Calcium and Sodium.

73. SYRUPUS CALCII HYPOPHOSPHITIS.

SYRUP OF HYPOPHOSPHITE OF CALCIUM.

Hypophosphite of Calcium	256 grains.
Sugar	12 av. ounces.
Water, enough to make	16 fluidounces.

Dissolve the Hypophosphite of Calcium in *eight* (8) *fluidounces* of cold water, add the Sugar, dissolve it by agitation, filter, and add enough Water through the filter to make *sixteen* (16) *fluidounces.*

Each fluidrachm contains 2 grains of Hypophosphite of Calcium.

74. SYRUPUS HYPOHOSPHITUM COMPOSITUS.

COMPOUND SYRUP OF HYPOPHOSPHITES.

(Compound Hypophosphites.)

Hypophosphite of Calcium	256 grains.
Hypophosphite of Potassium	128 "
Hypophosphite of Sodium	128 "
Hypophosphite of Manganese	16 "

Solution of Hypophosphite of Iron, (No. 65)	96 minims.
Sulphate of Quinine	8 grains.
Fluid Extract of Nux Vomica	½ fluidrachm.
Sugar	12 av. ounces.
Water	7 fluidounces.
Hydrochloric Acid	a sufficient quantity.
Syrup, enough to make	16 fluidounces.

Dissolve the solid Hypophosphites in the Water, add the Sugar, and shake until it is dissolved. Mix the Sulphate of Quinine with about *one* (1) *fluidounce* of the solution, and add enough Hydrochloric Acid (about 3 drops) to dissolve it. Then mix it with the rest of the solution, add the Fluid Extract of Nux Vomica, and finally enough Syrup to make *sixteen* (16) *fluidounces.*

Each fluidrachm contains 2 grains of Hypophosphite of Calcium; 1 grain, each, of Hypophysphite of Potassium and Sodium; ⅛ grain, each, of Hypophosphite of Iron and Manganese, and smaller quantities of bitter alkaloids.

NOTE.—This Syrup should not be confounded with the *Syrupus Hypophosphitum* (Syrup of the Hypophosphites) of the U. S. Pharm., 1880.

75. SYRUPUS PHOSPHATUM COMPOSITUS.

COMPOUND SYRUP OF PHOSPHATES.

("Chemical Food.")

Phosphate of Iron, (U. S. Ph. 1880)	256 grains.
Precipitated Carbonate of Calcium	500 "
Carbonate of Potassium	64 "
Carbonate of Sodium	40 "
Citric Acid	2 av. ounces.
Glycerin	2 fluidounces.
Phosphoric Acid, (U. S. Ph. 1880, 50%)	4 "
Orange Flower Water	6 fluidrachms.
Tincture of Cudbear, (No. 78)	2 "
Water	1½ fluidounces.
Syrup, enough to make	32 "

To the mixed Carbonates, in a capacious mortar, add the Citric Acid, and triturate them with the Glycerin. Then add the Orange Flower Water, about *twenty* (20) *fluidounces* of the Syrup, and gradually the Phosphoric Acid. When effervescence has ceased, add the Phosphate of Iron previously dissolved in the Water, transfer the whole to a graduated vessel, rinse the mortar with a little syrup, add the Tincture of Cudbear, and lastly, enough syrup to make *thirty-two* (32) *fluidounces.* Let the syrup stand during several days.

Each fluidrachm contains about 2 grains of Phosphate of Calcium, 1 grain of Phosphate of Iron, and smaller quantities of the Phosphates of Potassium and Sodium.

76. SYRUPUS SODII HYPOPHOSPHITIS.

Syrup of Hypophosphite of Sodium.

Hypophosphite of Sodium	256 grains.
Sugar	12 av. ounces.
Water, enough to make.	16 fluidounces.

Dissolve the Hypophosphite of Sodium in *eight* (8) *fluidounces* of cold Water, add the Sugar, dissolve it by agitation, filter, and add enough Water, through the filter, to make *sixteen* (16) *fluidounces.*

Each fluidrachm contains 2 grains of Hypophosphite of Sodium.

77. TINCTURA FERRI CITRO-CHLORIDI.

Tincture of Citro-Chloride of Iron.

("Tasteless Tincture of Iron.")

Solution of Chloride of Iron, (U. S. Ph.)	4 fluidounces.
Citric Acid,	2100 grains.
Bicarbonate of Sodium	2270 "
Alcohol	4 fluidounces.
Water, enough to make	16 "

Dissolve the Citric Acid in *four* (4) *fluidounces* of Water, heat the solution to the boiling-point, and gradually add the Bicarbonate of Sodium. When effervescence has ceased, add the solution of Chloride of Iron, and cool the mixture. Then add enough Water to make it measure *twelve* (12) *fluidounces,* and finally add the Alcohol.

Each fluidrachm contains about 7½ grains of dry Ferric Chloride.

Note.—This Tincture is approximately of the same strength, in metallic iron, as the officinal Tinctura Ferri Chloridi.

78. TINCTURA PERSIONIS.

Tincture of Cudbear.

Cudbear, in fine powder.	2 av ounces.
Diluted Alcohol, enough to make	16 fluidounces.

Pack the Cudbear in a percolator, and pour enough Diluted Alcohol on top, until *sixteen* (16) *fluidounces* of Tincture have been obtained.

79. VINUM CARNIS ET FERRI.

Wine of Beef and Iron.

(Beef, Iron, and Wine.)

Extract of Beef	256 grains.
Citrate of Iron and Ammonium	64 "
Water	½ fluidounce.
Simple Elixir, (No. 46)	2 fluidounces.
Stronger White Wine, (U. S. Ph. 1880) enough to make	16 fluidounces.

Dissolve the Citrate of Iron and Ammonium in *one-half* (½) *fluidounce* of Boiling Water. Pour the hot solution upon the Extract of Beef contained in a mortar or other suitable vessel, and triturate until a smooth mixture results. Then gradually add, while stirring, the Simple Elixir, and transfer the mixture to a graduated vessel, using enough Stronger White Wine to rinse the mortar and to make the product measure *sixteen* (16) *fluidounces.* Allow the mixture to stand during a few hours; then filter.

Each fluidrachm contains 2 grains of Extract of Beef and ½ grain of Citrate of Iron and Ammonium.

80. VINUM CARNIS, FERRI, ET CINCHONÆ.

Wine of Beef, Iron and Cinchona.

Extract of Beef	256	grains.
Citrate of Iron and Ammonium	64	"
Sulphate of Quinine	16	"
Sulphate of Cinchonine	8	"
Citric Acid	6	"
Water	½	fluidounce.
Simple Elixir, (No. 46)	4	fluidounces.
Angelica Wine, enough to make	16	fluidounces.

Dissolve the Citrate of Iron and Ammonium in *one-half* (½) *fluidounce* of Boiling Water, add to the hot solution the Citric Acid and the Sulphates of Quinine and Cinchonine, and, when they are dissolved, pour the hot solution upon the Extract of Beef contained in a mortar or other suitable vessel. Triturate the liquid and the Extract until they form a smooth mixture; then gradually add, while stirring, the Simple Elixir, and transfer the mixture to a graduated vessel, using enough Angelica Wine to rinse the mortar and to make the product measure *sixteen* (16) *fluidounces.* Allow the mixture to stand during a few hours, then filter.

Each fluidrachm contains 2 grains of Extract of Beef, ½ grain of Citrate of Iron and Ammonium, and smaller quantities of Cinchona Alkaloids.

81. VINUM PEPSIINI.

Pepsin, in scales	128	grains.
Glycerin	6	fluidrachms.
Water	1	fluidounce.
Hydrochloric Acid	75	minims.
White Wine, enough to make	16	fluidounces.

Mix the Water, Glycerin, and Hydrochloric Acid, and agitate the Pepsin with the mixture until it is dissolved. Then add enough White Wine to make *sixteen* (16) *fluidounces.* Allow to stand one week, then filter.

Each fluidrachm contains 1 grain of scaled Pepsin.

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FOR THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Societies and editors are respectfully requested to forward all publications intended for the American Pharmaceutical Association to the Permanent Secretary. European exchanges, if not sent by mail, will reach us through the Smithsonian Institution at Washington.

John M. Maisch,
143 North Tenth Street, Philadelphia, Pa.

American Druggist, New York, 1885.
Deutsch-Amerikanische Apotheker Zeitung, New York, 1885.
Oil, Paint, and Drug Reporter, New York, 1885.
Pharmaceutical Record, 1885.
Pharmaceutische Rundschau, 1885.
The Druggists' Circular, 1885.
American Journal of Medical Sciences, Philadelphia, 1885.
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Calendar of the University of Michigan for 1885.
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Proceedings of the New Jersey Pharmaceutical Association, 1885.
Index Catalogue of the Library of the Surgeon-General's Office U. S. A., Vol. VI.
Proceedings of the American Academy of Arts and Sciences, New Series XII, XIII, 1.
Transactions of the South Carolina Medical Association, 1885.
Documentary History of the State of Maine, Vol. III, containing the Trelawny Papers, Portland, 1884.

LIST OF SOCIETIES, LIBRARIES, JOURNALS, AND INDIVIDUALS,

TO WHOM COMPLIMENTARY COPIES OF THE PROCEEDINGS OF THIS ASSOCIATION ARE FORWARDED.

The State Libraries of all the States in the Union except Connecticut.

Maine Insane Asylum,	Augusta,	Maine.
Bowdoin College,	Brunswick,	"
Dartmouth College,	Hanover,	New Hampshire.
Amherst College,	Amherst,	Massachusetts.
Harvard University,	Cambridge,	"
Massachusetts College of Pharmacy,	Boston,	"
American Academy of Arts and Sciences,	"	"
Boston Athenæum,	"	"
City Library,	"	"
City Hospital,	"	"
Massachusetts General Hospital,	"	"
Medical Library Association,	"	"
University of Vermont,	Burlington,	Vermont.
Brown University,	Providence,	Rhode Island.
Medical Journal and Library Association,	Hartford,	Connecticut.
Trinity College,	"	"
Silas Bronson Library,	Waterbury,	"
Yale College,	New Haven,	"
Albany College of Pharmacy,	Albany,	New York.
College of Pharmacy of the City of New York,	New York,	New York.
Literary and Scientific Society of German Apothecaries,	"	"
American Druggist,	"	"
Deutsch-Americanische Apotheker Zeitung,	"	"
Druggists' Circular,	"	"
Oil, Paint, and Drug Reporter,	"	"
Pharmaceutical Record,	"	"
Pharmaceutische Rundschau,	"	"
Astor Library,	"	"
Mercantile Library,	"	"
Long Island Historical Society,	Brooklyn,	"
New Jersey State Lunatic Asylum,	Trenton,	New Jersey.
Philadelphia College of Pharmacy,	Philadelphia,	Pennsylvania.
Academy of Natural Sciences,	"	"
American Journal of Medical Sciences,	"	"
American Philosophical Society,	"	"
College of Physicians,	"	"

Franklin Institute,	Philadelphia, Pennsylvania.
Mercantile Library,	“ “
Pennsylvania Hospital,	“ “
Philadelphia Library,	“ “
Pittsburgh College of Pharmacy,	Pittsburgh, “
Maryland College of Pharmacy,	Baltimore, Maryland.
Maryland Academy of Sciences,	“ “
University of Maryland,	“ “
National College of Pharmacy,	Washington, District Columbia.
Bureau of Education,	“ “
Congressional Library,	“ “
Department of Agriculture,	“ “
Library of the American Medical Association,	“ “
Smithsonian Institution,	“ “
Surgeon-General, United States Army,	“ “
Surgeon-General, United States Marine Hospital Service,	“ “
Surgeon-General, United States Navy,	“ “
United States Patent Office,	“ “
Richmond Pharmaceutical Association,	Richmond, Virginia.
South Carolina Medical Association, Dr. J. L. Dawson, Secretary,	Charleston, South Carolina.
Louisville College of Pharmacy,	Louisville, Kentucky.
Cincinnati College of Pharmacy,	Cincinnati, Ohio.
Cincinnati Academy of Medicine,	“ “
Mussey Medical Library,	“ “
Longview Asylum,	Carthage, Hamilton county, O.
University of Michigan,	Ann Arbor, Michigan.
Chicago College of Pharmacy,	Chicago, Illinois.
The Western Druggist,	“ “
St. Louis College of Pharmacy,	St. Louis, Missouri.
Academy of Science of St. Louis,	“ “
National Druggist,	“ “
St. Louis Mercantile Library,	“ “
St. Louis Public School Library,	“ “
University of Wisconsin,	Madison, Wisconsin.
Kansas State University,	Lawrence, Kansas.
Minnesota State Medical Society, C. H. Boardman, M. D., Secretary,	St. Paul, Minnesota.
California College of Pharmacy,	San Francisco, California.

Montreal College of Pharmacy, Montreal, Canada.
Ontario College of Pharmacy, Toronto, Canada.
Pharmaceutical Department, Halifax Medical College, Nova Scotia.
Escuela de Farmacia, Mexico.
Sociedad de Farmacia Argentina, Buenos Ayres.
British Pharmaceutical Conference, London.
Pharmaceutical Society of Great Britain, London, 17 Bloomsbury Square.
Pharmaceutical Journal and Transactions, London.
Chemical News, London, Boy Court, Ludgate Hill, E. C.
Chemist and Druggist, London, 44 Cannon Street.
British Museum, London.
Philosophical Society, Glasgow.

Liverpool Chemists' Association.
Association of Chemists and Druggists, Wolverhampton.
Coventry and Warwickshire Pharmaceutical Association, Coventry.
Pharmaceutical Society at Edinburgh, 36 York Place.
Pharmaceutical Society of Ireland, Dublin.
Nederlandsche Maatschappij ter bevordering der Pharmacie Jacobus Polak, Secretary, Amsterdam.
Académie Royale de Médicine de Belgique, Bruxelles.
Société de Pharmacie Royale de Bruxelles.
Société Royale des Sciences Médicales et Naturelles, Bruxelles.
Société de Pharmacie d'Anvers.
École supérieure de Pharmacie, Paris.
Répertoire de Pharmacie, Paris.
Schweizerische Wochenschrift für Pharmacie, A. Klunge, Aubonne.
Zeitschrift d. Allg. Oesterreichischen Apotheker Vereines, Wien.
K. K. Gesellschaft der Aerzte, Wien.
K. Akademie der Wissenschaften, Wien.
K. Bayer. Akademie der Wissenschaften, München.
Pharmaceutisches Institut, Universität Erlangen.
Universität Strassburg.
Archiv der Pharmacie, Waisenhausbuchhandlung, Halle.
K. Akademie der Wissenschaften, Göttingen.
Pharmaceutische Gesellschaft in St. Petersburg, St. Petersburg.
Pharmaceutisches Institut, Dorpat, Russia.
Pharmaceutical Institution, Stockholm, Sweden.
Kongelige Norske Universitet i Christiani.
Archiv for Pharmacie, S. M. Trier, Kjobenhavn.
Denmark's Apotheker Forening, Gust. Lodze, President, Odense.
R. Biblioteca Nazionale, Firenze, Italy.
Archivio di Farmazia, Roma, Italy.
Pharmaceutical Society of Victoria, Melbourne, Australia.
Pharmaceutical Society of New South Wales, Sydney.
Pharmaceutical Society of New Zealand, Auckland.

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION.

CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market, by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulteration.

2. To encourage proper relations between Druggists, Pharmaceutists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing, and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a Permanent Secretary, a Local Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom, with the exception of the Permanent Secretary, shall be elected annually, and shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the annual interest of which only shall be used by the Association for its current expenses.

Article V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting, when, upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution.

BY-LAWS.

CHAPTER I.

Of the President and Vice-Presidents.

Article I. The President shall preside at all meetings of the Association; in his absence or inability, one of the Vice-Presidents, or in the absence of all, a President *pro tempore*, shall perform the duties of President.

Article II. He and the Vice-President shall be *ex officio* members of the Council.

Article III. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary *pro tempore.*

Article IV. In meetings the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports, and communications, and order the vote upon all proper questions at the proper time.

Article V. In all ballotings, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal, and in case of such equal division, the motion is lost.

Article VI. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality or impropriety, he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in cases where he prefers to submit the matter to the meeting; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

Article VII. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

Article VIII. He shall appoint all committees, unless provided for in the By-Laws, or otherwise directed by the Association.

Article IX. He shall sign the certificates of membership, and countersign all orders on the Treasurer. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

Article X. He shall present at each Annual Meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER II.

Of the Permanent Secretary.

ARTICLE I. The Permanent Secretary shall be elected to hold office permanently during the pleasure of the Association. He shall receive from the Treasurer an annual salary of $750, and the amount of his expenses incident to the meeting in addition to his salary.

ARTICLE II. He shall preserve fair and correct minutes of the proceedings of the meetings, and carefully preserve, on file, all reports, essays, and papers of every description received by the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Proceedings of the Association, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose; shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act; and shall notify every member of the time and place of each Annual Meeting.

ARTICLE IV. He shall be, *ex officio*, a member of the Council.

CHAPTER III.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall be elected annually, near the close of the Annual Meeting, and shall reside at or near the place where the next Annual Meeting of the Association is to be held.

ARTICLE II. He shall assist the Permanent Secretary in his duties; shall co-operate with the Council and any local committee in making arrangements for the Annual Meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

CHAPTER IV.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each Annual Meeting, the names of such members as have failed to pay their annual contributions for three years.

ARTICLE IV. He shall present a statement of his accounts at each Annual Meeting of the Council, that they may be audited; he shall receive an annual salary of $750, and the amount of his expenses incident to the meeting, in addition to his salary.

CHAPTER V.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services such sum as may be annually determined upon by the Council.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the Permanent Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the Permanent Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry, and Materia Medica, and the collateral branches of knowledge; on the changes in conditions of Pharmaceutical Institutions; together with such statistical, biographical, and obituary notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted; shall be written in a form fitted for the printer, and shall be presented completed at the Annual Meeting.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the Permanent Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VI.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which shall be empowered to transact business for the Association between the times of meeting, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association.

ARTICLE II. The Council shall consist of seventeen members, nine of whom shall be elected by ballot by the Association, in the following manner: Three of them to serve for one year, three for two years, three for three years. At each subsequent Annual Meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years.

ARTICLE III. The President, Vice-Presidents, Secretary, Local Secretary, Treasurer, and Reporter on the Progress of Pharmacy of the Association, shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association, from one Annual Meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the Annual Meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance,—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

ARTICLE VIII. *Section* 1. The Council shall have charge of the revision of the roll and the publication of the Proceedings.

Section 2. The Secretary of the Council shall read at one session of the Association the names of those candidates for membership which have been approved by the Committee on Membership, and the applicants shall be balloted for at the next session of the Council by the members present, when a vote of two-thirds shall be sufficient to elect them.

Section 3. The Council shall decide upon any objections which may be presented to them (which must be in writing with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be balloted for without first receiving the approval of the Council.

Section 4. The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears one copy of the annual publication of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sittings of the Association, a complete synopsis of the minutes of the Council, the reports of the President and committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as they may deem worthy of insertion, and shall fix the price at which the Proceedings shall be sold.

CHAPTER VII.

Of Committees.

ARTICLE I. There shall be elected annually four standing committees: A Committee on the Drug Market, to consist of five members; a Committee on Papers and Queries, a Committee on Prize Essays, and a Committee on Legislation, each to consist of three members.

ARTICLE II. The Committee on the Drug Market shall report annually the condition of the Drug Market, the fluctuations in the supply and demand of drugs and chemicals, the variations in quality, and the adulterations and sophistications coming under their observation or reported to them by others, with any suggestions or recommendations for the improvement or better regulation of the trade; and they shall be authorized to report upon any adulterations and sophistications of immediate interest, through the Pharmaceutical Journals, as soon as practicable after their discovery.

ARTICLE III. The Committee on Papers and Queries shall report, near the close of each Annual Meeting, a proper number of questions of scientific and practical interest, the answers to which may advance the interest of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV. Any person writing a paper for the Association must, to insure its publication in the Proceedings, refer the same, with a synopsis of its contents, to the Committee on Papers and Queries previous to the third session.

ARTICLE V. It shall be the duty of every Standing Committee making a report annually to the Association, in like manner to furnish a copy of the same, together with a synopsis of its contents, to the Committee on Papers and Queries, before the first annual session of the Association.

ARTICLE VI. The Committee on Prize Essays shall, within six months after the Annual Meeting at which the essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all other respects they shall be governed by the stipulations expressed by the donor. The decision of the Committee, with such comments upon the successful essay only as they may deem proper, may be published in the Journal of Pharmacy.

ARTICLE VII. The Coommittee on Legislation shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report to each stated meeting of the Association what legislation on the subject has occurred during the year.

CHAPTER VIII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry, and Botany, who may be specially interested in Pharmacy and Materia Medica, who, after duly considering the objects of the Association and the obligations of the Constitution and By-Laws, are willing to subscribe to them, are eligible to membership.

ARTICLE II. Any person eligible to membership may make application in writing with the endorsement of any two members of the Association in good standing, to any member of the Council, who shall report his application to the said Council.

ARTICLE III. No person shall be a member of this Association, nor shall his name be placed upon the roll, until he shall have signed the Constitution and paid into the Treasury the sum of *Five Dollars* as an initiation fee, and the annual contribution for the current year, which sums must accompany the application.

ARTICLE IV. Every member shall pay in advance to the Treasury the sum of *Five Dollars* as his yearly contribution. and is liable to lose his membership by neglecting to pay said contribution for *three successive years*.

ARTICLE V. Any member not in arrears to the Association, who shall pay to the Treasurer the sum of $75 during the first year of his connection therewith, or after five years $70, or after ten years $60, or after fifteen years $50, or after twenty years, $40, shall become a life member, and shall be exempt from all future annual contributions.

ARTICLE VI. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the Annual Meetings, who, *if present*, become members of the

Association on signing the Constitution and paying the annual contributions for the current year and the usual initiation fee: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials should be sent to the Permanent Secretary *at least two weeks* in advance of the Annual Meeting.

ARTICLE VII. Members shall be entitled, on the payment of *Five Dollars*, to receive from the Treasurer a certificate of membership signed by the President, one Vice-President, Permanent Secretary, and Treasurer.

ARTICLE VIII. Persons constitutionally elected to membership become permanent members, and their membership can cease only by resignation, non-payment of dues, or by expulsion, as provided in these By-Laws.

ARTICLE IX. Resignations of membership shall be made in writing to the Permanent Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE X. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at some regular session.

ARTICLE XI. Pharmacists, chemists, and other scientific men, who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office, or vote at the meetings.

CHAPTER IX.

Of Meetings.

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. The order of business at the first session of each Annual Meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the Permanent Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. The Council shall read the names of the candidates for membership, as provided in Section 2, Article VIII., Chapter VI.

Section 6. Reports of committees shall be presented, read by their titles, the synopsis or in full, and laid on the table for future consideration.

Section 7. The President shall call the roll of Colleges and State Associations represented, requesting each delegation in turn to appoint one member, the person so selected to act as a committee to nominate officers for the Association, the Standing Committees, and members of the Council for the ensuing year; in addition to which he shall appoint five members who are not delegates, to act with the committee.

Section 8. The minutes of the Council shall be read in full at the Annual Meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, their acts shall be revised, so as to be acceptable to the Association.

Section 9. Incidental business may be called up.

ARTICLE III. The order of business at the second session at each Annual Meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding meeting, which may be amended, if necessary, and shall then be approved.

Section 3. The report of the Committee on Nominations shall be read; when the President shall appoint tellers, and the Officers and Committees nominated shall be balloted for.

Section 4. The officers shall take their respective places.

Section 5. The Council shall present names recommended for membership.

Section 6. Reports of Standing Committees shall be read.

Section 7. Reports of Special Committees shall be read.

ARTICLE IV. At each subsequent session except such as may be held for specific purposes, after the expiration of one hour from the appointed time of meeting, the report of the Committee on Papers and Queries shall be considered, unless by a vote of three-fourths of the members present and voting thereon.

CHAPTER X.

Of Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the meeting, and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order in which they are arranged. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

CHAPTER XI.

Miscellaneous.

ARTICLE I. In all such points of order as are not noticed in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

ARTICLE II. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at any subsequent session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

ARTICLE III. No one or more of these By-Laws shall be suspended.

BY-LAWS OF THE COUNCIL.

CHAPTER I.

ARTICLE I The officers of the Council shall consist of a Chairman, Vice-Chairman, and Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices immediately after the election of the new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman; or, in the absence of both a Chairman *pro tempore* shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary of $50.

ARTICLE II. He shall post in a conspicuous place in the meeting-rooms the names of the applicants for membership.

ARTICLE III. He shall read all the papers handed him by the Chairman for that purpose, shall call and record the yeas and nays whenever they are required to be called; he shall notify the chairman of every special committee of his appointment, giving him a list of his colleagues and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting.

CHAPTER IV.

Committee on Membership.

ARTICLE I. The Committee on Membership shall consist of five members of the Council, to be elected annually by ballot. The Permanent Secretary and the Treasurer of the

Association shall be *ex officio* members of this committee. The committee shall elect their chairman immediately after their election by the Council.

ARTICLE II. The Committee on Membership shall be charged with the duty of keeping a correct list of the members of the Association, and shall present the list of applicants for membership, who have complied with the requirements of the By-laws of the Association, to the Council.

ARTICLE III. They shall furnish appropriate obituary notices of deceased members for publication in the Proceedings.

ARTICLE IV. The chairman shall receive an annual salary of $150.

CHAPTER V.

On Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council, who shall elect their chairman immediately after their own election by the Council.

ARTICLE II. The Committee on Publication shall have charge of the publication and distribution of the Proceedings, and may select annually the portrait of a deceased member to be issued with the Proceedings.

CHAPTER VI.

On Committee on Finance.

ARTICLE I. The Committee on Finance shall consist of three members. They shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

CHAPTER VII.

Of the Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the Permanent Secretary. They shall annually, at the meetings, and after due notice through the Pharmaceutical Journals, receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made and of the amount of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. After considering these applications, the Committee shall, at as early a date as possible, report to the Council, recommending such grants from the available funds as they may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

On Meetings.

ARTICLE I. The Council shall meet on the day immediately preceding that fixed for the assembling of the Association, and at such other times as they may adjourn to, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special meeting shall be called.

ARTICLE III. Five members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman and Secretary.
2. Election of the Standing Committees of the Council, as follows:
   a. Committee on Membership, consisting of five members of the Council, the Permanent Secretary and Treasurer.
   b. Committee on Finance, three members.
   c. Committee on Publication, five members.
   d. Committee on Centennial Fund, three members.
3. Unfinished and deferred business from the meeting of the last Council, or such business as is especially referred to the Council from the Association.
4. The reading of the names of new members as provided in the By-laws.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment, and before the final adjournment, the minutes of the last session shall be read and approved.

CHAPTER IX.

Miscellaneous.

ARTICLE I. Three members of any of the standing committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its committees, and which can be disposed of by a positive or a negative vote, the Chairman of the Council, or the chairman of the committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when, upon receiving the votes of three-fourths of the members present. it shall become a part of these By-laws.

FORM OF APPLICATION FOR MEMBERSHIP.

APPROVING of the objects of the American Pharmaceutical Association, I am desirous of joining it in membership; and having read its Constitution and By-laws, I hereby signify my approval of the same, and subscribe to them.

Name in full,

Address,

TESTIMONIALS.

The undersigned, members in good standing, being personally acquainted with of testify to his moral character, his skill as a practical druggist and pharmaceutist, and his professional probity and good standing, and they recommend him for membership in the American Pharmaceutical Association.

NAMES.	ADDRESS.

GENERAL RULES ON FINANCE.

ADOPTED 1883, AMENDED 1885.

First, The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

Second, Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the Chairman of the Council.

Third, All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

Fourth, The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

Fifth, The Chairman of the Council shall be the custodian of the bonds and saving-bank books, representing the several funds belonging to the Association; and bonds and bank books shall be in the name of the Treasurer, and the accounts of same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council.

Sixth, There shall be annually appointed, by the Council, an Examining Committee, this Committee to consist of three members residing in or near the same city or town, the chairman to be a member of the Finance Committee.

Seventh, The Treasurer shall balance his books July 1st of each year, and shall make out, previous to the fifteenth day of July following, his annual report for the financial year just closed.

Eighth, The Treasurer having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc, with the report, to the Chairman of the Examining Committee, at such time and place in July of each year as said chairman may direct.

The Chairman of the Council shall forward to the Chairman of the Examining Committee, at the same time and place, the bonds, savings bank books, and accounts of the same that may be in his hands.

Ninth, Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, savings bank books and accounts of the same to the Chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Examining Committee.

Tenth, There shall be a meeting of the Examining Committee in July of each year. and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and, previous to the 1st day of August following, to make a report thereon, in writing, to the Chairman of the Council.

ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

AUSTRIA.

Anton von Waldheim, *Vienna*, 1871.

BELGIUM.

A. T. DeMeyer, *Brussels*, 1868.
Norbert Gille, *Brussels*, 1868.

ENGLAND.

Dr. John Attfield, *London*, 1871.
Dr. Robert Bentley, *London*, 1872.
Henry B. Brady, *Newcastle-on-Tyne*, 1871.
Michael Carteighe, *London*, 1882.
Thomas Greenish, *London*, 1882.
Joseph Ince, *London*, 1882.
Dr. J. Redwood, *London*, 1871.
Richard Reynolds, *Leeds*, 1882.
George W. Sanford, *London*, 1882.
Geo. F. Schacht, *Clifton*, *Bristol*, 1882.

FRANCE.

Stanilas Martin, *Paris*, 1872.
Dr. G. Planchon, *Paris*, 1877.
Dr. J. Léon Soubeiran, *Montpellier*, 1871.

GERMANY.

Dr. Christian Brunnengraeber, *Rostock*, 1882.
Dr. Adolph Duflos, *Annaberg*, 1871.
Dr. F. A. Flückiger, *Strassburg*, 1868.
Dr. Hermann Hager, *Pulvermühle bei Fürstenberg*, 1868.
Dr. Carl Schacht, *Berlin*, 1882.
Dr. G. C. Wittstein, *Munich*, 1868.

ITALY.

Cav. Niccola Sinimberghi, *Rome*, 1882.

NETHERLANDS.

Dr. J. E. De Vrij, *Hague*, 1871.

RUSSIA.

Dr. G. Dragendorff, *Dorpat*, 1868.
J. von Martenson, *St. Petersburg*, 1882.

SWITZERLAND.

Dr. Edward Schaer, *Zurich*, 1877.

ACTIVE MEMBERS.

Members are requested to report any inaccuracies in these lists, and to notify the Secretary and Treasurer of all changes of address.

(The names of life members in SMALL CAPITALS. Names of life members under the old Constitution in *italics.*)

UNITED STATES OF AMERICA.

ALABAMA.

Mobile.

Candidus, Philip Charles	1857
Hawkins, Joseph Thomas	1878
Mohr, Charles	1871
Moore, Thomas F.	1878
Punch, William Francis	1874
Savage, Thomas Jameson	1881
Van Antwerp, Garet	1880

Selma.

Galt, Edward Pegram	1883

ARKANSAS.

Hot Springs.

Cabell, George William	1880
Menard, Robert Patterson	1883
Newman, Alcuin Eason	1880
Pollard, Frank Wilder	1880

Little Rock.

Bond, John Barnitz	1883

Searcy.

Zimmerman, John L.	1883

CALIFORNIA.

San Francisco.

Beckett, Frederick Arthur	1885
Brackett, Aurick Smith	1868
Calvert, John	1870
Dawson, John H	1882
Joy, Edwin Wolcott	1882
Lengfeld, Abraham Louis	1879
Mack, Adolph	1880
Moffit, Thomas S	1861
Runyan, Edward Wheelock	1875
Searby, William Martin	1882
Simpson, William	1870
Steele, Henry	1859
Steele, James Gurden	1859
Wenzell, William Theodore	1870

Alameda, Alameda Co.

Elbe, Constantine Berthold	1877

Eureka, Humboldt Bay.

Powell, Robert Baldwin	1880

Los Angeles.

Preuss, Edward Anthony	1882

Red Bluff.

Darrough, Charles Henry	1884

Vallejo, Solano Co.

Frost, James	1870
Topley, James	1869

COLORADO.

Central City.

Best, John	1866

Denver.

Frazee, George Blair	1880
Hartung, Hugo Rudolph	1876
Scholtz, Edmund Louis	1881
Steinhauer, Frederick	1881
Walbrach, Arthur	1881

Salida.

Thurber, Allen Russell	1880

COLUMBIA, DISTRICT OF.

Washington.

Becker, Charles	1875
Boyd, George Washington	1883
Bury, Edward Berkley	1870
Christiani, Charles	1874
Coumbe, Oscar Henry	1883
Cromwell, Zachariah William	1870

Duckett, Walter G.	1876
Dufour, Clarence Reuter.	1876
Fickling, Charles Hollingshead	1883
Johnston, Henry Augustus	1883
Knabe, Gustavus Alexander	1876
Lewis, Samuel Edwin	1875
Lockhart, George Bradfield	1883
Major, John Richards	1873
Martin, John Charles	1883
Milburn, John Alexander	1858
Milburn, Washington Coad	1883
Murray, Talbot Chambers	1883
Nattans, Arthur	1883
Pettingill, Edward True	1880
Reinlein, Paul	1856
Schafhirt, Adolph Julian	1876
Short, Joshua Eagan	1883
Simms, Giles Green Craycroft	1860
Thompson, William Scott	1871
Walton, Joseph Richardson	1883
Wehrly, Thomas McAleer	1883

CONNECTICUT.

Ansonia.

Bristol, Charles Edward	1880

Hartford.

Chapin, Frederick Hastiags	1880
Goodrich, Stephen	1875
Goodwin, Lester Henry	1875
Rapelye, Charles Andrew	1876
Williams, John Kirby	1875

Litchfield.

Gates, Howard Eugene	1873

Meriden.

Parker, John Herbert	1880

Middletown.

Pitt, John Richard, Jr.	1872

New Britain.

Thomson, Edward Willett	1880

New Haven.

Benedict, Willis	1882
Francis, Walter R.	1882
Gessner, Emil Adolph	1878
Spalding, Warren Alphonso	1876
Sperry, Herman Jay	1880
Wells, Romanta	1877

Norwich.

Osgood, Hugh Henry	1875
Sevin, Nathan Douglas	1875

Stamford.

Haight, William Bogardus	1872

Thompsonville, Hartford Co.

Smith, Edward Newton	1885

Waterbury.

Dikeman, Nathan	1859
Munson, Luzerne Ithiel	1872
Wilcox, Frederick	1878
Woodruff, Roderick Samuel	1876

West Winsted.

Phelps, Dwight	1873

Westville.

Melvin, J. Lacy	1882

Willimantic.

Wilson, Frank Milton	1883

Winsted.

Renouff, James Theron	1877

DAKOTA.

Mitchell.

Warne, Henry Lee	1881

DELAWARE.

Wilmington.

Belt, Zedekiah James	1876
Smith, Linton	1870

FLORIDA.

Cedar Key.

Wooldridge, Napoleon	1883

Fort George.

Rollins, John Francis	1859

Opopka, Orange Co.

Kent, Robert Restieux	1855

Waldo.

Wheeler, Lucien Fitch	1858

GEORGIA.

Albany.

Welch, Leonard Edward	1878

Atlanta.

Behre, Charles Henry Ernst	1882
Bradfield, Louis Henry	1878
Jacobs, Joseph	1882
Rankin, Jesse Willis	1877
Schumann, Peter John	1878
Schumann, Theodore	1860

Augusta.

Durban, S. C.	1883
Land, Robert Henry	1859

Cuthbert.

Stanford, James William	1878

Macon.

Brunner, Norman Isaac	1878
Hunt, Leonard Washington	1878
Ingalls, John	1876
McConville, Thomas Aloysius	1864

Rome.

Fenner, William Roane	1871

IDAHO TERRITORY.

Murray, Shoshone Co.

Ingalls, Albert Orfila	1885

ILLINOIS.

Bradford, Stark Co.

Plummer, David Graham	1869
Plummer, William Pitt	1881

Camp Point, Adams Co.

Bartells, George Case	1881

Canton.

Ruble, John B.	1884

Champaign.

Cunningham, A. P.	1884

Chicago.

Ade, Samuel Gottlob	1883
Bartlett, Nicholas Gray	1864
BIROTH HENRY	1865
Blahnik, Lorenz	1881
Blocki, William Frederick	1863
Borland, Matthew Wilson	1876
Buck, George	1860
Button, Charles Edwin	1881
Clapp, Chambers Brown	1883
Cowdrey, Robert Hall	1879
Dale, William Macmillan	1880
EBERT, ALBERT ETHELBERT	1864
Fiske, Calvin J.	1869
Fuller, Henry Weld	1865
Fuller, Oliver Franklin	1869
Gale, Edwin Oscar	1857
Gale, William Henry	1857
Garrison, Herod Daily	1869
Grassly, Charles William	1884
Guy, George Omar	1884
Hallberg, Carl Swante Nicanor	1879
Hamilton, Emil	1881
Hartwig, Charles F.	1881
Henes, William Frederick	1876
Heuermann, Henry William	1869
Hogey, Julius Henry	1880
Jacobus, Judson Schradlow	1870
Kadlec, Lawrence Wesley	1880
Lord, Thomas	1882
Maisch, Henry Charles Christian	1885
Martin, Hugo W. C.	1881
Maynard, Henry Sherman	1880
McPherson, George	1865
Moore, James Penn	1872
Oldberg, Oscar	1873
Parsons, John	1865
Patterson, Theodore H.	1869
Plautz, C. Herman	1881
Reinhold, William	1866
Sargent, Ezekiel Herbert	1864
Scherer, Andrew	1884
Somers, Frank Giddings	1877
Wheeler, Charles Gilbert	1876
WHITFIELD, THOMAS	1865
Wilson, Julius Henry	1869
Woltersdorf, Louis	1865
Zahn, Emil Augustus	1881

Danville.

Winslow, Edwin Cook	1879

Galesburg.

Clark, Albert Burr, Jr.	1868

Highland.

Knoebel, Edmund	1882
Mueller, Adolphus	1871

Hinckley, DeKalb Co.

Coffin, Samuel Lockwood	1879

Mount Sterling.

Rickey, Charles Francis	1885

Peoria.

Allaire, Charles Bowen	1880
Zimmermann, Charles	1881

Peru, La Salle Co.

Hattenhauer, Robert Christopher	1881

Quincy.

Schroeder, Hermann	1871

Springfield.

Day, Charles Wesley	1873

INDIANA.

Anderson.

Buck, Albert Byron	1879

Aurora.

Riddell, James A	1879

Bremen.

Miller, Otho Fenn Smith	1885

Cambridge City.

McCaffrey, James	1883

Evansville.

Schmidt, Florian Charles	1882
Schlaepfer, Henry John	1879

Fairmount.

Edwards, Nathan Wilson	1879

Indianapolis.

Dill, John B	1878
Driggs, Nathaniel S	1881
Earnshaw, William Jonathan	1881
Frauer, Herman E	1881
Haag, Julius A	1879
Hurty, John N	1882
Lambert, John Albert	1879
Lilly, Eli	1878
Lynn, Winfield Scott	1882
Martin, Emil	1878
Miller, Charles Edward	1880
Mueller, Louis Henry	1879
Schrader, Henry	1869
Sloan, George White	1857
Staley, Michael C.	1881

Jasper, Dubois Co.

Mehringer, Joseph A.	1882

Jeffersonville.

Loomis, John Clarence.	1876

Kendallville.

Lohman, George H	1872

Lafayette.

Hilt, David	1879
Warder, Robert Browne	1885
Yeakel, Nathan Webb	1879

Madison.

Harper, Frank Merritt	1874

New Albany.

Knoefel, August	1879

Rensselaer.

Kanal, Emmet	1882

Seymour.

Andrews, Josiah Harding	1879

South Bend.

Eliel, Leo	1882

Tell City.

Schreiber, August	1876

Terre Haute.

Baur, Jacob	1879
Buntin, William Campbell	1874
Cox, David P.	1884

Vincennes.

Watjen, Herman J.	1882

IOWA.

Boone.

Townsend, Abraham R.	1880

Burlington.

Wigert, Carl Reinhold	1876

Cedar Falls, Black Hawk Co.

Bryant, William Cullen	1881

Cedar Rapids, Lynn Co.

Truax, Charles	1882

Clinton.

Major, Oscar	1880

Davenport.

Ballard, John Winthrop	1871
Harrison, Jacob Hugh	1883
Thackeray, William Thomas	1884

Decorah.

Weiser, Emilius Ilgenfritz 1880

Des Moines.

Weaver, Charles Augustus 1880

Dubuque.

Ferdinand, George Adam 1879
Ruete, Theodore William 1870

Fort Dodge.

Crawford, Robert Wilson 1881
Oleson, Olaf Martin 1877

Fort Madison.

Schafer, George Henry 1871

Indianola.

Buffington, Cyrus Adams 1880

Iowa City.

Boerner, Emil Louis 1877

Marshalltown.

Birchard, Abner Theodore 1881

Monticello.

Tiarks, Hermann 1876

Muscatine.

Krepe, J. Theodor 1884

Sioux City.

Moore, Silas Harwood 1880
More, Arthur James 1881

Stuart.

Treat, Joseph Augustus 1885

Waterloo.

Wangler, Conrad David 1876

KANSAS.

Abilene.

DeHuy, Bernard Henry 1883

Belle Plaine.

Butler, George Frank. 1883

Cain City.

Crona, Sixtus Ewald Seme 1885

Coffeyville.

Slosson, George 1882

Coldwater.

Sombart, John Edward 1881

Emporia.

Morris, Lemuel Iorwerth 1880

Florence.

Stanford, William A. 1881

Girard.

Walker, George 1881

Lawrence.

Leis, George 1869

Leavenworth.

Brown, Robert J. 1862

Nickerson, Reno Co.

Sturtevant, T. Frank 1880

Peabody.

Robert, Daniel John. 1881

Salina.

Seitz, Oscar 1881

Topeka.

Merrell, Ashbel H. 1884

KENTUCKY.

Bowling Green.

Burge, James Oscar 1878

Carrollton.

Geier, Oscar William 1880

Cloverport.

Martin, Charles C. 1881

Covington.

Zwick, George Gilbert 1874

Eminence.

Porter, Chelton Scott 1882

Flemingsburg.

Reynolds, John J 1876

Frankfort.

Averill, William Henry. 1874

Louisville.

Beckman, Oscar Albert 1879
Colgan, John 1867
Davis, Vincent 1874
Diehl, Conrad Lewis 1863

Fischer, Phil 1883
Goebel, Edward. 1884
Jones, Simon Newton 1870
Kessler, Edward Frederick 1879
Miller, Frederick Christopher 1874
Newman, George Abner 1866
Pfingst, Edward Charles 1874
Pfingst, Ferdinand John 1867
Pfingst, Henry Adolph 1874
Rademaker, Hermann Henry 1879
Renz, Frederick J. 1883
Rogers, Wiley 1874
Scheffer, Emil. 1872
Schiemann, Edward Bernard 1880
Schoettlin, Albert John 1882
Strassel, William 1870
Sutton, Peter Priest 1871

Newport.

Feth, Joseph George. 1880

Shelbyville.

McKenney, Jesse Fisher 1878

Uniontown.

Hardigg, William Leopold 1881

LOUISIANA.

New Orleans.

Finlay, Alexander Kirkwood 1883
Keppler, Christian Lewis. 1882
Lavigne, Jean Baptiste 1883
Lewis, Ben. 1883
Lyons, Isaac Luria 1875
Mellon, John J. 1883

Baton Rouge.

Brooks, Francis Marion 1879

Bayou Goula.

Viallon, Paul Louis 1870

Franklin.

Frere, Alexander G. 1882

Houma.

Gonaux, François. 1883

New Iberia.

Lee, James Augustin. 1856

Plaquemine.

Dellavallade, Jean Michel 1873

Thibodeaux.

Roth, Eugene Norbert 1880
Thibodeaux, Joseph Theogine . . . 1870

MAINE.

Augusta.

Partridge, Charles Kimball 1867

Bangor.

Harlow, Noah Sparhawk. 1859
Sweet, Abel Sylvester, Jr. 1883
Sweet, Caldwell. 1881

Bath.

Anderson, Samuel 1876

Belfast.

Moody, Richard Henry 1876

Biddeford.

Boynton, Herschel 1875

Blue Hill.

Morrill, Benjamin 1876

Eastport.

Shead, Edward Edes 1866

Ellsworth.

Parcher, George Asa 1875

Pittsfield.

Libby, Henry Fitzgerald 1882

Portland.

Cummings, Henry Thornton 1853
Dana, Edmund, Jr. 1877
Frye, George Carlton 1879
Hay, Henry Homer 1867
Perkins, Benjamin Abbott 1878

Winterport.

Morrell, Mary Helen 1883

MARYLAND.

Baltimore.

Baxley, Jackson Brown 1856
Brack, Charles 1876
Burrough, Horace 1883
Caspari, Charles, Jr. 1883
Culbreth, David Marvel Reynolds . . 1883
Dohme, Charles Emile 1863
Dohme, Lewis 1859
Eareckson, Edwin. 1875
Edwards, William Fletcher 1883
Elliott, Henry Alexander. 1859
Emerson, Isaac Edward 1883
Emich, Columbus Valentine 1863

Frames, James Parker	1868
Gosman, Adam John	1870
Hancock, John Francis	1863
Jennings, Nathaniel Hynson	1857
Lauer, Michael John	1865
Lautenbach, Robert	1870
Monsarrat, Oscar	1856
Moore, Jacob Faris	1856
Perkins, Elisha Henry	1857
Risk, Clarence H.	1882
Roberts, Joseph	1856
Russell, Eugene Janus.	1856
Russell, Edward Walton	1856
Sappington, Richard	1870
Sharp, Alpheus Phineas	1855
Simon, William	1885
Thompson, William Silver	1856
Thompson, William Partlow	1874
Thomsen, John Jacob	1856
Thomsen, John Jacob, Jr.	1883
Thornton, William Edward	1883
Tilyard, Charles Slade	1867
Webb, John Alansen	1870
Winkleman, John Henry	1864
Woodward, Samuel Morris	1874

Chestertown.

Stam, Colin Augustus	1882
Toulson, Melbourn Ashbury	1883

Cumberland.

Campbell, William Pendleton	1879
Herman, John George	1878
Shriver, Henry	1876
Shryer, Thomas Wilson	1875

Frederick City.

Schley, Steiner	1878

Hagerstown.

Winters, Jonas	1863

MASSACHUSETTS.

Boston.

Babo, Leopold	1859
Bartlet, William Williams	1875
Bassett, Charles Harrison	1867
Bolles, William Palmer	1875
Boyden, Edward Cleveland	1874
Browne, Clarence Edward	1880
Burley, Edward Porter.	1877
Burnett, Joseph.	1852
Campbell, Isaac Towle	1859
Canning, Henry	1865
Carter, Solomon	1865
Chapin, William Amos.	1880
Colcord, Samuel Marshall	1852
Colton, James Byers	1865
Cramer, Max.	1881
CUTLER, EDWARD WALDO	1859
Davenport, Bennett Franklin	1879
Doliber, Thomas	1859
Drury, Linus Dana	1871
Durkee, William C.	1885
Follansbee, Sherman	1875
French, George Washington	1865
Godding, John Granville	1875
Goodale, Thomas Trefethen	1879
Hoyt, George Melvin	1875
Jenkins, Luther Lincoln	1867
Jones, James Taber	1875
Jordan, William Henry	1871
Kelly, Edward Samuel.	1871
Lincoln, Henry Ware	1853
Lowd, John Colby	1871
Markoe, George Fred. Holmes	1863
Melvin, James Samuel	1853
Metcalf, Theodore.	1857
Mowry, Albert D.	1884
O'Brien, James John.	1875
Patch, Edgar Leonard	1872
Patten, Ichabod Bartlett	1858
Pierce, William Herbert	1879
Prescott, Horace Augustus	1875
Restieaux, Thomas	1853
Sawyer, William Frederick.	1885
Sewall, David Jewett	1875
Sharples, Stephen Paschell	1875
Shedd, Edwin Walter	1879
SHEPPARD, SAMUEL AIRUS DARLINGTON	1865
Siegemund, Charles Augustus	1882
Smalley, Elijah	1860
Snow, Jesse Walker	1875
Stowell, Daniel.	1875
Tower, Levi, Jr.	1860
Turner, Thomas Larkin	1853
Underwood, Charles Gordsford	1865
Webster, Stephen	1875
Wilson, Benjamin Osgood	1859
Winslow, Samuel Wallis	1875
Woodbridge, George Washington	1859

Andover.	
Parker, George Hawkins	1874
Cambridge.	
Hubbard, John Henry	1866
Wood, Edward Stickney	1879
Cambridgeport.	
Bayley, Augustus Ramsey	1859
Orne, Joel Stone	1859
Orne, Charles Parker	1874
Charlestown.	
Marshall, Ernest Clifton	1875
Stacey, Benjamin Franklin	1860
Chelsea.	
Buck, John	1855
Buck, John Lynian	1883
East Pepperell.	
Dunham, Charles Sumner	1875
Fitchburg.	
Choate, John	1877
Great Barrington.	
Eddie, Charles Hurlbert	1882
Lillie, Charles Herbert	1875
Whiting, Frederick Theodore	1863
Haverhill.	
Emerson, Charles B	1883
Frothingham, Edward Gilman	1875
Holyoke.	
Ball, Charles Ely	1885
Morgan, Richard Evan	1875
Lawrence.	
Whitney, Henry Martin	1859
Lee.	
Pease, Francis Merrick	1880
Lowell.	
Bailey, Frederick	1869
Butler, Freeman Hall	1874
Hood, Charles Ira	1871
Kidder, Samuel	1859
Lynn.	
Colcord, Joseph Webster	1882
Marlborough.	
Hartshorn, Frederick Arthur	1880

Middleboro.	
Drake, Charles William	1873
Natick.	
Daniels, Samuel Olney	1875
New Bedford.	
Blake, James Edwin	1866
Bunker, Elihu	1885
Hadley, Frank Rufus	1872
Lawton, Charles Henry	1873
Lawton, Horace Allen	1873
Shurtleff, Israel Hammond	1875
Taylor, John Pitman	1875
Newburyport.	
Goodwin, William W	1853
Newton.	
Hudson, Arthur	1882
Newton Centre.	
Noble, John Joseph	1875
North Andover.	
Berrian, George Washington	1857
Lawrence, John Herbert	1885
Peabody.	
Grosvenor, David P., Jr	1881
Pittsfield.	
Atwood, Luther Lee	1876
Quincy.	
Whall, Joseph Stokes	1873
Rockland.	
Easton, Luther Waite	1875
Estes, Joseph Joslyn	1870
Rockport.	
Blatchford, Eben	1857
Salem.	
Luscomb, William E	1881
Nichols, Thomas Boyden	1876
Price, Charles H	1882
Saugus.	
Hill, James Ward Harris	1880
Shelbourne Falls.	
Baker, Edwin	1875
Somerville.	
Cowdin, George Henry	1875
Flanagan, Lewis Cass	1875

Springfield.

Webber, Joseph Terrence. 1873

Stockbridge.

Clark, William Bills 1880

Taunton.

Drown, Lowell Appleton. 1883

Walpole.

Pilsbury, Frank Otis 1881

Waltham.

Johnson, Horace Irving 1880

Warren.

Harwood, Frank Lucian 1875

West Acton.

Hutchins, Isaiah 1880

West Stockbridge.

Moore, James S. 1882

Worcester.

Bush, William 1875
Dinsmore, George Frederick 1879
Scott, George Theodore 1883
Scott, Nelson Ryan 1859
Williams, Duane Burnett 1881

MICHIGAN.

Adrian.

Ross, Ellison Halsey 1880

Ann Arbor.

Brown, Henry J 1882
Eberbach, Ottmar 1869
Garrigues, Samuel Smith 1855
Green, Arthur L. 1884
Prescott, Albert Benjamin 1871
Wrampelmeier, Theodore J. 1882

Battle Creek.

Wardell, Robert C. 1860

Calumet, Haughton Co.

Macdonald, Daniel T 1884

Detroit.

Allen, Albert Willard 1885
Caldwell, James William 1875
Hawkins, Henry 1880
Johnston, William 1860
Lyons, Albert Byron. 1885
MacKimmie, George D 1881
Perry, Frederick William Riley . . . 1885
Ronnefeld, Theodore 1866
Stevens, Alonzo Burdette 1885
Stone, Clarence George 1884
Vernor, James 1866

East Saginaw.

Melchers, Henry 1869
Prall, Delbert Elwyn 1876

Ionia.

Gundrum, George 1882

Jackson.

Latimer, Robert Fulton 1857

Kalamazoo.

McDonald, George 1871

Manistee.

Lyman, Asahel Hubert 1884

Muskegon.

Jesson, Jacob 1872

Nottawa, St. Josephs Co.

Todd, Albert M. 1885

Saginaw City.

Keeler, William Henry 1872

Schoolcraft.

James, George Riley. 1869

MINNESOTA.

Anoka.

Fries, Chas. Joseph Val. 1885

Duluth.

Boyce, Samuel F 1871

Minneapolis.

Allen, E. Floyd 1885
Huhn, George 1884

Preston.

Weiser, Albert 1880

St. Paul.

Scherling, Gustav 1884
Simmon, Karl 1880
Stierle, Adolph 1882
Sweeny, Robert Ormsby 1866

Spring Valley.

Rohde, Claus Frederick	1885

MISSISSIPPI.

Aberdeen, Monroe Co.

Cordon, John Gray Myers	1882
Eckford, Joseph William	1883
Tindall, Graham McFarland	1880

Bay St. Louis.

Deléry, Edgar	1878

Fayette.

West, Howell Forman	1883

Greenville.

Finlay, John Pelham.	1883

Holly Springs.

Athey, John Howard	1883

Jackson.

Ash, Matthew Franklin	1856

Port Gibson.

Shreve, John Alexander	1880

MISSOURI.

St. Louis.

Ahlbrandt, Henry Ernst	1877
Alexander, Maurice William	1871
Blank, Alois	1871
Boehm, Solomon	1871
Catlin, Ephron	1871
Chamberlain, Guilford Tracy	1853
Curtman, Charles Otto	1871
Good, James Michener.	1871
Grandjean, Charles	1871
Grandjean, Eugene	1871
Hassebrock, Henry Fred.	1884
Hemm, Francis	1881
Jones, Charles Kendall.	1867
Klie, George Henry Charles.	1878
Leitch, Arthur.	1860
Mallinckrodt, Edward	1869
Meyer, Christian Fred. Gottlieb	1860
Pauley, Frank Charles	1879
Physick, Henry Sandford	1870
Richardson, James	1882
Richardson, Joseph Clifford	1871
Sander, Enno	1858
Scheffer, Henry William.	1863
Sennewald, Ferdinand William	1865
Tomfohrde, John William.	1878
Ude, George	1871
Uhlich, Ferdinand G.	1881
Vordick, August Henry	1874
Wall, Otto A.	1884
Westmann, Frank Henry.	1882
Williamson, Edward John	1876

Carl Junction.

Morgan, James.	1859

Carrollton.

Pettit, Henry M.	1881

Columbia.

Hurt, James Francis.	1879

Glenwood.

Gray, Gilbert D.	1881

Hannibal.

Walker, Charles	1881

Kansas City.

Arnold, Henry Clay	1881
Ford, James M	1881
Ford, William Thomas	1878
Gallagher, John A.	1881
Lahme, Charles Adolph	1881
Love, Charles Edward.	1881
Young, Judson J.	1881

Macon.

Field, Amos	1871

Marshall.

Franklin, Philip H.	1881

Mexico, Adrian Co.

Llewellyn, John Frederick	1867

Mound City.

Browning, Woodville	1882

Rich Hill.

Youngs, William	1883

Sedalia.

Fleischmann, Augustus Theodore	1885

Weston.

Parr, John Conrad	1856

NEBRASKA.

Omaha.

Goodman, Charles Frederick	1871

Kennard, Frank W 1883
Kuhn, Norman Archibald 1878

NEVADA.

Virginia City.

Perkins, William Alexander. 1869

NEW HAMPSHIRE.

Claremont.

Spofford, Charles Byron 1884

Concord.

Eastman, Charles Smith 1874
Underhill, George Francis 1874

Dover.

Pinkham, Alonzo Taylor. 1874
Rackley, Benjamin Franklin 1874
TUFTS, CHARLES AUGUSTUS 1856
Vickery, William Henry. 1874

Exeter.

MERRILL, CHARLES AUGUSTUS . . . 1858

Greenville.

Hall, Charles Edwin 1884

Manchester.

Miville, Francis Charles 1877
Perry, Bayard Taylor 1876

Nashua.

Russell, Elias Smith. 1875
Whitman, Nelson Samuel 1875

New Market.

Dearborn, George Luther 1853
Twombly, John Herbert 1880

Portsmouth.

Preston, Andrew Peabody 1881
Thacher, Joseph Haven 1859

Rochester.

Hanson, Dominicus 1878
Sanderson, Stephen Francis 1880

Somersworth.

Moore, George 1859

Suncook.

Hildreth, Charles Francis 1874

NEW JERSEY.

Bloomfield.

Scherff, John Philip 1877

Bordentown.

Carslake, George Middleton. 1880

Burlington.

Vandegrift, John A 1867

Camden.

Brown, Albert Potts. 1870
Test, Alfred William 1870

East Orange.

Davis, George Randolph. 1883
Rumsey, Samuel Louis 1876

Elizabeth.

Brant, Edmund Wade. 1882
Drake, Jonathan Baker. 1875
Kent, Henry Avery, Jr. 1880
Loveland, William F 1882
Oliver, William Murray 1875

Elizabethport.

Frohwein, Richard 1867

Englewood.

Rockefeller, Lucius 1880

Freehold.

Walker, Ansell 1880
Walker, John Putnam 1881

Hackensack.

Adams, Hazen Wooster 1879

Hoboken.

KLUSSMAN, HERMANN 1876

Jersey City.

Abernethy, Maxwell 1865
Dougherty, Samuel Edward. 1875
Foulke, James 1881
Turner, Isaac Worthington. 1882
White, George Henderson 1868
Wienges, Conrad 1875

Matawan, Monmouth Co.

Slater, Frank H. 1882

Medford.

Thorn, Henry Prickett 1879

Morristown.

Carrell, Eugene Ayers 1875
Dalrymple, Charles Hoagland . . . 1882

Mt. Holly.

WHITE, AARON SMITH. 1860

Newark.

Betzler, Jacob	1880
Bruguier, Francis.	1876
Holzhauer, Charles	1873
Sayre, William Henry	1877
Smith, Charles Bradley	1868
Smith, Israel Preston	1876
Stamford, William Harrison	1876
Townley, William Mattison	1875
Vandervoord, Ransford Wells	1870
Van Winkle, Abraham	1871

New Brunswick.

Rust, William	1870

Newton.

Ryerson, Henry Ogden	1882

Orange.

Musler, Abram	1883
Nicholas, William E.	1884
Parsons, Robert Edwin	1877

Orange Valley, Essex Co.

Yatman, John Lewis	1880

Plainfield.

Reynolds, Howard Prescott	1875
Shaw, Robert Johnston	1875

Red Bank, Monmouth Co.

Lockwood, Samuel Alexander	1880

Roselle.

Tiernan, Frank Mortimer	1880

Salem.

Bassett, Joseph	1880

South Amboy.

Jacques, George Washington	1869

Trenton.

De Cou, James Clarke	1880
Mangold, Gustavus Adolph	1875
Rickey, Randal	1870
Vansant, Robert Hays	1879

NEW YORK.

New York City.

Atwood, Herman White	1873
Balluff, Paul	1860
Balser, Gustavus	1875
Bedford, Peter Wendover	1859
Bendiner, Samuel	1882
Billings, Henry Merry	1869
Buehler, Edward Handy	1874
Burdge, Jacob Uriah	1876
Campbell, Horace Willard	1875
Carle, John, Jr.	1860
Chandler, Charles Frederic	1867
Collins, Louis Dell	1880
Currie, John Harper	1858
Davis, Benjamin	1869
Dick, Dundas	1879
Ditman, Andrew J.	1868
Dudley, Oscar Earle	1877
Eimer, Charles	1872
Fairchild. Benjamin Thomas	1875
Fisher, William	1862
Fougera, Edmund Charles	1867
Fraser, Edward Allen	1873
Gardner, Charles H.	1881
Gardner, Robert Winthrop	1867
Griffith, William Henry	1874
Haviland, Henry	1857
Hays, David	1867
Hegeman, Johnson Niven	1880
Herzfeld, Herman	1885
Higgins, James Starkey	1862
Hobart, Charles Henry	1880
Hoffmann, Frederick	1867
Hohenthal, Charles Frederick Leberecht	1865
Hudnut, Alexander	1857
Ihlefeld, Conrad H.	1881
Imgard, Julius	1882
Jungmann, Julius	1879
Kalish, Julius	1875
Kimmel, Henry	1867
Knapp, Frank Fiero	1880
Krehbiel, Gustavus	1865
Laber, Julius	1881
Lazell, Lewis T.	1858
Lehn, Louis	1874
Maclagan, Henry	1883
Macmahan, Thomas Jackson	1871
Main, Thomas Francis	1872
Massey, William Morton	1885
McIntyre, Byron Floyd	1876
McIntyre, Ewen	1873
McKesson, John, Jr.	1867
Milhau, Edward Leon	1858
Molwitz, Ernest	1867
Morrison, Thomas Ormsby	1876
Neergaard, Sidney Herbert	1880

O'Neil, Henry Maurice	1879
Osann, Bernhard	1882
Osmun, Charles Alvin	1868
Otto, Charles Henry	1880
Painter, Emlen	1870
Peixotto, Moses Levi Maduro	1869
Pfingsten, Gustavus	1873
Reichard, Frederick Alfred	1871
Reiss, Edward Charles	1882
Rice, Charles	1870
Ricksecker, Theodore	1870
Robbins, Charles Albert	1876
Robbins, Daniel C.	1862
Royce, Lucien Merriam	1866
Sands, George Gedney	1867
Scofield, James Stephen	1867
Seabury, George John	1876
Shearer, Edward Young	1880
Sheils, George Emanuel	1860
Skelly, James Joseph	1866
Starr, Thomas	1870
Tscheppe, Adolph	1876
Tuska, David	1881
Wanier, George Simon	1876
Weinman, Oscar Christian	1873
White, Philip Augustus	1872
Wichelus, Frederick	1881
Wickham, William Hull	1870
Wilson, William	1876
Wohlfarth, Justin	1879
Zellhoefer, George	1876

Brooklyn.

Aspinall, Walter Albert	1880
Baker, Grenville Mellen	1880
Benjamin, James Henry	1878
Brooks, George Washington	1879
Close, George Cassidy	1858
Curtiss, Charles Grenville	1866
Cutts, Foxwell Curtis, Jr.	1875
Davis, William Mortimer	1879
Day, Carlos Erastus	1870
Daycock, William Henry	1874
De Forest, William Pendleton	1879
Dennin, Charles	1875
Douglas, Henry, Jr.	1875
Dunn, John Augustus	1867
Du Puy, Eugene	1852
Eccles, Robert Gibson	1885
Hale, Frederick	1855
Heydenreich, Emile	1867
Jones, Thomas	1868
Kitchen, Charles William	1865
Krieger, Philip	1876
Levy, Adolph	1877
Livingston, Barent Van Buren	1872
McElhenie, Thomas Diamond	1872
Menninger, Henry Joseph	1866
Newman, George Anthony	1865
Nicot, Louis Emile	1875
Niebrugge, John August	1861
Ollif, James Henry	1867
Owens, Richard John	1860
Pyle, Cyrus	1859
Ramsperger, Gustavus	1860
Reusch, Ernst	1882
Reynolds, Charles E.	1882
Rich, Willis S.	1882
Sayre, Edward Augustus	1877
Snyder, Ambrose Chancellor	1867
Squibb, Edward Hamilton	1882
Squibb, Edward R.	1858
Stevens, Luther Fuller	1879
Strachan, William Edward	1880
Tartis, Alfred Joseph	1867
Ubert, Julius	1876
Underhill, Joseph Garness	1879
Vincent, William	1870
Wackerbarth, John	1883
Wynn, William	1867

Albany.

Clement, Henry Bratt	1880
French, William Barker	1880
Gaus, Charles Henry	1879
Gaus, Louis Henry	1880
Gibson, Charles H.	1880
Huested, Alfred Birch	1879
McClure, Archibald	1880
McClure, William Henry	1880
Michaelis, Gustavus	1882
Sauter, Louis	1879
Turner, George Heather	1880
Walker, William	1880
Wheeler, Leonard Hiram	1883

Angola, Erie Co.

Oatman, Le Roy Sutherland	1872
Penfold, Henry J.	1882

Athens.

Post, Elisha	1876

Auburn.

Stanley, Edgar Clark	1880

Au Sable Forks.

Smith, Jay Hungerford 1883

Bergen.

Fisher, Amos Sawyer 1880

Buffalo.

Darlington, James Augustus 1882
Drefs, Charles A. 1882
Harries, Oscar L. 1882
Hayes, Horace Phillips 1880
Peabody, William Huntington . . . 1857
Rano, Charles Orlando 1866
Tibbs, William Henry 1871

Castile, Wyoming Co.

Rolph, Charles W. 1882

Catskill.

Du Bois, William Laneman 1880
Dykeman, George Albert 1880
Mott, George Frederick 1880

Cornwall, Orange Co.

Hazen, Peter Perry 1882

Croton Landing.

Henry, Charles (Dworniczak) . . . 1881

East Greenbush, Rensselaer Co.

Munger, John F. 1881

Elmira.

Holmes, Clayton Wood 1873

Fishkill on Hudson.

Moith, Augustus Theodore 1860

Flushing.

Hepburn, John 1873
James, William T. 1882

Geneseo, Livingston Co.

Rogers, Arthur Henry 1882

Gloversville, Fulton Co.

Miller, Jason Albert 1879
Van Auken, Jerrie A. 1880

Hannibal.

Brewster, Wadsworth J. 1880

Holly, Orleans Co.

Bishop, Francis M. 1882

Hume, Alleghany Co.

Hopper, George S. 1881

Jamaica, L. I.

Baylis, Lewis Fosdick 1880
Goodale, Harvey Galusha 1879
Peck, George Lyman 1883

Johnstown.

Cahill, John Francis 1880

Kinderhook.

Van Alstyne, Franklin B. 1882

Kingston.

Dedrick, William Frederick 1884

Little Falls, Herkimer Co.

Hurley, John 1882

Lockport.

Rommel, Emanuel 1882
Sweet, Frederick K. 1880

Luzerne, Warren Co.

Miller, George Yerrington 1872

Malone.

Miller, Robert McCleferty 1880

Middletown.

KING, JAMES THEODORE 1859
Rogers, William Henry 1859

Mount Vernon.

Gill, George 1872

Newburgh.

Chapman, Isaac C. 1882
Gorham, John Ransom, Jr. 1879

Niagara Falls.

Griffith, Hiram Elijah 1875

Nyack, Rockland Co.

De Graff, David. 1879

Olean.

Coon, James Van Deventer 1880

Port Jervis.

Cook, George Edward 1872

Potsdam.

Thatcher, Harvey Dexter. 1865

Randolph, Cattaraugus Co.

Sweet, William S. 1882

Richfield Springs.

Smith, Willard Alfred 1880

Rochester.

Aman, Henry 1882
Davis, Edward Hatch 1880
Haass, G. Herman 1872
Paine, James Dixon 1857
Schmitt, Joseph M. 1882
Smith, Willard 1880

Rogersfield, Clinton Co.

Richardson, Frank 1885

Rome.

Bissell, John Gordon 1875
Broughton, Albert James 1876
Owens, James Alanson 1882

Sag Harbor.

Tooker, William Wallace 1879

Saratoga Springs.

Fish, Charles Frederick 1866
Mingay, James 1873
Pennington, Thomas Henry Sands . . 1877

Schenectady.

Davis, Edward L. 1881
Hanson, Willis Tracy 1880

Silver Creek, Chautauqua Co.

Montgomery, Melvin 1882

Spencerport.

Milliner, William Seward 1877

Stapleton, S. I.

Feeny, James 1882

Stillwater, Saratoga Co.

Schermerhorn, Winfield Scott 1880

Syracuse.

Dawson, Edward Seymour, Jr. . . . 1876
Snow, Charles Wesley 1876

Tompkinsville, S. I.

Bassett, John William 1875

Tonawanda, Erie Co.

Scoville, Charles Emery 1882

Utica.

Blaikie, William 1879
Cone, John Wright 1876

Wappinger's Falls

Shrader, John L. 1880

Waterville, Oneida Co.

Bissell, Emery Gilbert 1879

Wellsville, Alleghany Co.

Hall, Edwin Bradford 1879

Yonkers.

Eschmann, Fred. William R. 1880
Finkel, Charles Edwin 1880

NORTH CAROLINA.

Chapel Hill.

Saunders, Richard Banbury 1858

Durham, Orange Co.

Vaughan, P. W. 1882

Fayetteville.

Hinsdale, Samuel Johnson 1875
Sedbury, Bond E. 1882

Goldsboro.

Hatch, Eugene Francis 1883

Greensboro.

Porter, W. C. 1880

Raleigh.

Lee, Addison Sherwin 1873
Simpson, William 1873

Tarboro.

Zoeller, Edward Victor 1878

Washington.

Gallagher, Charles Kewell 1857

Wilmington.

Harding, John Haywood 1881
Munds, James Cassidy 1878

OHIO.

Cincinnati.

Bain, Andrew Watson 1874
Beebe, John Walter 1880
Eger, George 1864
Elfers, Joseph C. 1864
Feemster, Joseph Hall 1873

Goodman, Emanuel	1879
Gordon, William John Moclester	1854
Greve, Theodore Lund August	1864
Greyer, Julius	1880
Heineman, Otto	1864
Helman, Charles Martin	1864
Heun, Emil	1881
Hildreth, Newton Gough	1879
JUDGE, JOHN FRENCH	1866
Karmann, William	1864
Klayer, Louis	1884
Koehnken, Herman Henry	1875
Kuerze, Robert Meinrad	1880
Lammert, C. Joseph	1881
Lloyd, John Uri	1870
Martin, William J.	1881
Meininger, Albert	1881
Merrell, George	1879
Phillips, Charles Wilson	1881
Rendigs, Charles Peter	1876
Reum, Herman Frank	1864
Ruppert, John	1880
Sauer, Louis W.	1882
Schrack, Leo S.	1881
Schuerman, Frederick	1881
Serodino, Herman	1880
Thorp, Abner	1879
Vilter, Herman	1881
Voss, George William	1885
Wagner, Henry	1876
Walton, Harry C	1881
Wells, Jacob David	1864
Yorston, Matthew Mackay	1864

Akron.

Amstrong, Andrew Morehouse	1876
Smith, Joseph Stahle	1878
Inman, Charles Trask	1885

Belleville, Richland Co.

Warren, Mrs. Ella F.	1882

Bluffton, Allen Co.

Hauenstein, William	1883
Murray, Francis Marion	1876

Bryan.

Snyder, Alva Leach	1873

Chillicothe.

Baumgartner, Frederick	1880
Howson, Walter Henry	1875
Nipgen, John Alvin	1879

Circleville.

Evans, Samuel B	1881

Cleveland.

Asplin, John Harding	1882
Benedict, James I.	1882
Bruce, James	1882
Cobb, Ralph Lathrop	1883
Dreher, Louis	1881
Feil, Joseph	1885
Gaylord, Henry Cleveland	1869
Gegelein, Frederick L.	1881
Glines, George W	1881
Haber, Louis Anthony	1881
Hechler, George Louis	1882
Hopp, Lewis Christopher	1876
Keiper, Louis	1881
Lehr, Philip	1885
Linden, Hugo F.	1882
May, Arthur	1881
Mayell, Alfred	1872
Myers, Daniel	1882
Parsons, Richard	1882
Rosenwasser, Nathan	1880
Schambs, George Matthias	1882
Schellentrager, E. A.	1882
Scott, William Johnson	1872
Slosson, Frank W.	1882
Smithnight, Albert	1882
Spencer, Peter Ignatius	1872
Spieth, William F	1882
Urban, Jacob P	1881
Vaupel, Charles P.	1872
Weichsel, Franz	1881

Columbiana.

Ink, Charles Elliott	1885

Columbus.

Bruck, Philip H.	1884
Herbst, Frederick William	1882
Hoffman, Otto L.	1883
Huston, Charles	1872
Karb, George James	1883
Kaufman, George B.	1882
Schueller, Ernst	1881
Schueller, Frederick William	1880
Sherwood, Louis Walker	1882

Dayton.

Weusthoff, Otto Sittell	1879

Delhi, Hamilton Co.

Carpenter, Samuel William	1883

Delphos.

Evans, Hugh W.	1881
Wahmhoff, Julius Henry	1880

Gallipolis.

Schaaf, Justice Henry	1875

Hamilton.

Schwartz, John C	1871

Logan.

Harrington, Frank	1869

Massillon, Stark Co.

Baltzly, Zachariah Taylor	1876
Kirchhofer, Peter Paul.	1881

Middletown.

Johnson, Charles Brayton	1876

Morristown.

Fisher, John Vance	1883

Napoleon.

Leist, Jacob L.	1881

Navarre.

Grossklaus, John Ferdinand	1859

New Madison, Darke Co.

Hagemann, James F. S.	1882

North Baltimore, Wood Co.

Clark, Frank P	1882

Salem, Columbiana Co.

Hawkins, Michael Smith	1870

Springfield.

Casper, Thomas Jefferson	1867
Coblentz, Virgil.	1882
Ludlow, Charles	1872
Siegenthaler, Harvey N	1882

Tiffin.

Fleck, Jacob J	1883
Marquardt, Jacob F	1881

Toledo.

Hohley, Charles	1872
Reed, Isaac Newton	1881

Troy.

Tobey, Charles William	1879

Watertown.

Bohl, Conrad	1881

West Liberty.

Kurfurst, Henry F.	1881

Wooster.

Ohliger, Lewis Philip	1871

Youngstown.

Nagle, Asher Christian	1881

Zanesville.

Graham, Willis H.	1881
Hatton, Edgar Melville	1878

OREGON.

Portland.

Sitton, Charles Edward	1878

PENNSYLVANIA.

Philadelphia.

Angney, John R.	1867
Baker, Walter Theron	1885
Bakes, William Courtney.	1864
Bauer, Louis Gustavus	1867
Blair, Andrew.	1865
Blair, Henry Cowen	1868
Borell, Henry Augustus.	1874
Boring, Edwin McCurdy	1867
Bower, Henry.	1860
Bower, Henry Albert.	1868
Bowker, James	1876
Bullock, Charles	1857
Bunting, Samuel Sellers	1857
Campbell, Hugh.	1876
Campbell, Samuel.	1864
Cook, Thomas Penrose	1877
Dobbins, Edward Tompkins.	1867
Eberle, Charles Louis	1865
Eddy, Henry Clay	1869
Ellis, Evan Tyson	1857
England, Robert.	1868
Fox, Peter Paul.	1869
Fruh, Carl Daniel Stephan	1876
Genois, Louis.	1876
Gerhard, Samuel	1873
Grahame, Israel Janney	1856
Grove, John Eberly	1868
Haenchen, Charles Eugene	1865
Hance, Edward H.	1857
Hancock, Charles W.	1868
Hassinger, Samuel Ellphat Reed.	1880
Heintzelman, Joseph Augustus	1858
Hoskinson, J. Thomas, Jr.	1881

Jenks, William J.	1858
Johnson, Benjamin Franklin	1859
Jones, Alexander Henry	1874
Jones, Daniel Sexton	1859
Jones, Edward Charles	1864
Keasbey, Henry Griffith	1873
Keeney, Caleb Reynolds	1868
Keys, Roger	1868
Kline, Mahlon Norwood.	1876
Koch, Louis	1872
Krewson, William Egbert	1875
MAISCH, JOHN M.	1856
Mattison, Richard Vornselons.	1873
McIntyre, William	1868
McKelway, George Irwin	1874
Mellor, Alfred	1864
Miller, Adolphus William	1868
Milligan, Decatur.	1867
Moore, Joachim Bonaparte	1860
Moorhead, William Walker.	1876
Murray, Bernard James	1882
Newbold, Thomas Mitchell.	1876
Ottinger, James Jeremiah	1876
Parrish, Dillwyn.	1870
Patterson, James Lemon	1876
Perot, Thomas Morris	1857
Pile, Gustavus	1881
Preston, David.	1868
Procter, Wallace	1874
REMINGTON, JOSEPH PRICE	1867
Riley, Charles William	1868
Rittenhouse, Henry Norman	1857
Robbins, Alonzo	1865
Roche, Edward Manning	1868
Rosengarten, Mitchell George.	1869
Sayre, Lucius Elmer	1883
Shivers, Charles	1860
Shinn, James Thornton	1860
Shoemaker, Richard Martin	1869
Shryock, Allen.	1868
Simpers, John Wilmer.	1874
Somers, Richard Miller	1876
Spannagel, Charles Christian	1874
Stewart, Francis Edward.	1884
Taylor, Alfred Bower	1852
Thompson, William Beatty.	1858
Trimble, Henry	1876
Troth, Samuel Fothergill	1857
Walsh, Robert Henry	1879
Warner, William Richard.	1857
Webb, William H.	1867
Weber, William	1872
Weidemann, Charles Alexander.	1868
Wendel, Henry Edward	1873
Wiegand, Thomas Snowdon.	1857
Wolff, Lawrence	1882
Worthington, Jeremiah Willits	1873
Wright, Archibald Wesley	1868
Zeilin, John Henry	1859

Allegheny City.

Armor, Alpheus	1882
Eggers, Frederick Hermann	1872
Keck, William H.	1885
Robertson, Archibald C	1882

Allentown.

Klump, Charles C.	1880

Beaver, Beaver Co.

Andriessen, Hugo.	1875

Bellefonte, Centre Co.

Zeller, William S	1881

Bristol.

Pursell, Howard.	1880

Carlisle.

Horn, Wilbur Fisk.	1876

Chambersburg.

Cressler, Charles Henry	1868

Columbia.

Meyers, James Alfred	1867

Danville.

Sechler, James C	1878

Derry Station.

Thomas, George Massena	1883

Easton.

Weaver, John Archibald.	1873

Erie.

Nick, Frederick	1883

Franklin.

Riesenman, Joseph	1883

Hanover, York Co.

Eckert, Edwin Gilbert.	1883
Snively, Andrew Jackson.	1883

Harrisburg.

George, Charles Theodore	1873
Gorgas, George Albert.	1884

Gross, Edward Ziegler 1883
Miller, Jacob Augustus 1873
Weills, William M. L 1885

Hyde Park, Luzerne Co.

Morgan, Benjamin George 1876

Lancaster.

HEINITSH, CHARLES AUGUSTUS . . . 1857

Lebanon.

Karch, Joseph Jacob 1876
Lemberger, Joseph Lyon 1858
Redsecker, Jacob Henry 1881

Lewisburg, Union Co.

Schaffle, Samuel Wilson Wykoff . . 1876

Lock Haven.

Prieson, Adolph 1880

McKeesport.

Bochert, George 1883
Pritchard, Benjamin Elliott 1885

Mansfield, Tioga Co.

Ridgway, Lemuel A. 1882

Milton.

Alleman, Emanuel Allison 1880

Minersville.

Burns, John Kellar 1876

New Brighton.

Kennedy, Thomas 1880

Norristown.

Poley, Francis Henry 1880
Stahler, William 1880

Oil City.

Griffith, Albert Richard 1870

Pittsburg.

Beach, Clifton Hilliard 1883
Cherry, James Bonbright 1868
Emanuel, Louis 1878
Holland, Samuel Smith 1876
Hostetter, Charles Michael 1870
Kelly, George A. 1882
Kerr, James, Jr. 1876
Nisbet, William Washington 1883
Schneider, Mathias Martin 1883
Slocum, Frank Leroy 1880
Stevens, John Henry 1885
Todd, William James 1885
Wilson, Albert Hemphill 1883

Pittston.

Rhoades, Stephen Howard 1876

Pottsville.

Deibert, Thomas Irvin 1882
Kennedy, George Washington . . . 1869

Quakertown.

Penrose, Stephen Foulke 1871

Reading.

Fox, Daniel Soder 1872
Raser, John Bernard 1872
Smith, Stephen Douglas 1883
Stein, Jacob Henry 1869
Ziegler, Philip Milton 1867

Scottdale, Westmoreland Co.

Cummings, Theodore Foster 1882
McNeil, John Murray 1882

Shamokin.

Hutchison, Hazard Snowden 1885
Smink, William Henry R. 1885

Shippensburg.

Fleming, Frank Byerly 1883

Smethport, McKean Co.

Armstrong, Alvin Backus 1882

Towanda.

Porter, Henry Carroll 1880

West Chester.

Evans, Joseph Spragg 1877

White Haven.

Driggs, Charles M. 1881

Wilkesbarre.

Wolf, Nathaniel 1878

Williamsport.

Cornell, Edward Augustus 1873
Duble, Jesse Balderston 1870

York.

Patton, John Franklin 1880

RHODE ISLAND.

Newport.

BLACKMAN, LYMAN RAWSON 1865
Taylor, James Henry 1875

Providence.

Alfreds, Henry James 1883
Blanding, William Bullock. 1875
Calder, Albert Layton 1859
Cotton, William Henry 1885
Danforth, Edmund Culver 1878
Greene, William Ray 1883
Leith, Harvey Isaac. 1883
Mason, Norman Nelson 1875
Reynolds, William Keyes 1876
Wood, Mason B. 1882

Westerley.

Collins, Albert Burlingame 1882

SOUTH CAROLINA.

Aiken.

Harbers, William Henry. 1875

Charleston.

Aimar, Charles Pons 1879
Burnham, Edward Steinmeyer. . . . 1874
Eckel, Augustus William. 1874
Luhn, Augustus Johann 1873
Marsteller, George Ludwig 1883
Michaelis, Charles Otto 1874
Panknin, Charles Frederick. 1874

Columbia.

Thomas, Oscar Ernest 1882

TENNESSEE.

Memphis.

Hessen, George Archibald 1880
Robinson, James Scott. 1869
Safford, William Burr 1875

Nashville.

Laurent, Eugene Leonard 1872
Thomas, James, Jr. 1875
Wharton, John Criddle 1872
Wharton, William Henry 1876

TEXAS.

Austin.

Morley, William Jarman 1876

Bryan.

McLelland, Robert Clayton 1880

Corsicana.

Campbell, John Gordon 1879

El Paso.

Irvin, William Armstrong 1879

Fort Worth.

Harper, Harry W. 1881
Powell, Thomas Wallace. 1874
Wells, Ebenezer Miller 1878

Galveston.

Preston, Calvin Walbridge 1884

Marshall.

Lancaster, Edwin W. 1884

Waco.

King, Walter Blackburn 1883

VERMONT.

Brandon.

Crossman, George Alvin 1872

Burlington.

Van Patten, William James 1876

Chester.

Pierce, Frederick Webster 1879

Morrisville.

Gates, Amasa O. 1876

Rutland.

Higgins, Albert Warren 1870
Lewis, Elam Clark 1870

St. Johnsbury.

Bingham, Charles Calvin. 1875
Randall, George Dallas 1875

White River Junction.

Trask, Charles Mitchell 1875

Windsor.

Paine, Milton Kendall. 1875

VIRGINIA.

Danville.

Cole, W. H. 1882
Wiseman, Henry Adolphus. 1883

Fredericksburg.

Hall, Marshall Carter 1870

Norfolk.

Jackson, Edward Calvert. 1883
Masi, Frederick Henry 1873

Petersburg.

Knock, Thomas Franklin 1882

Richmond.

Baker, Thomas Roberts 1873
Bodeker, Henry 1873
Purcell, John Barry 1875
Scott, William Henry 1873

WASHINGTON TERRITORY.

Seattle.

Kellogg, Gardner 1882

Walla Walla.

Holmes, Henry Elliott. 1880

WEST VIRGINIA.

Charleston, Kanawha Co.

Boggs, Edwin Leslie 1872
Potterfield, Clarence A. 1882

Parkersburg.

Williams, Alfred Neveth 1883

Wheeling.

Bocking, Edmund. 1874
Gray, William Howlett 1880
Menkemeller, Charles 1880
Williams, William H. 1880
Young, Alexander Thomas 1876

WISCONSIN.

Beloit.

Fenton, Frank S. 1881

Eau Claire.

Godding, Edward Robert 1884

Evansville, Rock Co.

Griswold, De Witt Clinton 1881

Fond du Lac.

Huber, Jacob Charles 1880

Fountain City,

Bechmann, Charles Richard 1882

Geneva.

Miner, Morris Ashbel 1880

Janesville.

Prentice, Fred. F. 1876

Lake Geneva.

Arnold, Robert Bruce 1879

La Crosse.

Beyschlag, Charles 1880

Madison.

Hollister, Albert H. 1884
Power, Frederick Belding 1872

Mayville, Dodge County.

Sauerhering, R. 1884

Milwaukee.

Abbott, Frank 1880
Conrath, Adam 1881
Crolius, Frank M. 1884
Dadd, John Alfred. 1880
Dohmen, Peter L. 1884
Drake, John Ransom 1860
Gessler, Max 1884
Kienth, Hans 1884
Schrank, Charles Henry 1876
Senier, Frederick Sutherland 1874

Neillsville.

Sniteman, Charles C. 1881

Sheboygan.

Zaegel, Max Robert 1884

Watertown.

Eberle, Herman Theodore 1875

DOMINION OF CANADA.

NEW BRUNSWICK.

Kentville.

Masters, Robert Silas. 1883

Moncton.

Estey, Edwin M. 1882

NOVA SCOTIA.

Halifax.

Simson, Francis Cook 1876

Pictou.

Fraser, Robert Peden 1885

ONTARIO.

Goodrich.

Jordan, Frederick Francis	1877

Lindsay.

Gregory, Edmund	1875

London.

Saunders, William	1860

Simcoe.

Foster, William Orrville	1881

Stratford.

Waugh, George James	1862

Toronto.

Hodgetts, George	1877
Johnson, Stuart William	1881
Lander, John Cambridge	1877
Lowden, John	1875
Pearce, James H.	1880
Robinson, William Sherlock	1877
Rose, Henry John	1872

Windsor.

Priddy, Robert Samuel	1882

PRINCE EDWARD ISLAND.

Charlottetown.

Dodd, Simon W.	1884

QUEBEC.

Montreal.

Gray, Henry Robert	1867
Mason, Alfred Henry	1884

Quebec.

McLeod, Roderick	1880

Three Rivers.

Williams, Richard Wellington	1883

BERMUDA.

Hamilton.

Heyl, James B.	1863

MEMBERS RESIDING IN EUROPE.

Burroughs, Silas Mainvielle, London, England	1876
Wellcome, Henry Solomon, London, England	1875

ALPHABETICAL LIST OF MEMBERS.

HONORARY MEMBERS.

Attfield, Dr. John, Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, W. C., England.
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Duflos, Dr. Adolph, Professor, Annaberg, Germany.
Flückiger, Dr. Frederick, Professor in the University of Strassburg, Germany.
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Martin, Stanislas, Paris, France.
Planchon, Dr. G., Professor, Paris, France.
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Schacht, George F., F. C. S., 52 Royal York Cresct., Clifton, Bristol, England.
Schaer, Dr. Edward, Professor of Pharmacy, Zurich, Switzerland.
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Soubeiran, Dr. J. Léon, Professor of Pharmacy, École de Pharmacie, Montpellier, France.
Waldheim, Anton von, 17, Himmelpfortgasse, Wien, I., Austria.
Wittstein, Dr. G. C., 47 Königstrasse, München, Germany.

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Adams, Hazen W., No. 73 Main street, Hackensack, N. J.

Ade, Samuel G., No. 126 Milwaukee ave., Chicago, Ill.

Ahlbrandt, Henry E., S. E. cor. Fifteenth and Carr streets, St. Louis, Mo.

Aimar, Charles P., No. 469 King street, Charleston, S. C.

Alexander, Maurice W., cor. Fourth and Market streets, St. Louis, Mo.

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Allaire, Charles B., No. 108 Main street, Peoria, Ill.

Alleman, Emanuel A., care of Cyrus Brown, Milton, Pa.

Allen, Albert W., Detroit, Mich.

Allen, E. Floyd, 1020 Hennepin avenue, Minneapolis, Minn.

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Anderson, Samuel, No. 48 Front street, Bath, Me.

Andrews, Josiah H., S. E. cor. Chestnut and Second streets, Seymour, Ind.

Andriessen, Hugo, P. O. Box 39, Beaver, Beaver county, Pa.

Angney, John R., cor. Fifth and Spruce streets, Philadelphia, Pa.

Armor, Alpheus, No. 57 Taylor avenue, Allegheny City, Pa.

Armstrong, Alvin B., Smethport, McKean county, Pa.

Armstrong, Andrew M, No. 106 East Market street, Akron, O.

Arnold, Henry C., Kansas City, Mo.

Arnold, Robert B., Main and Broad streets, Lake Geneva, Wis.

Ash, Matthew F., P. O. Box 129, Jackson, Miss.

Aspinall, Walter A., Nos. 1147 and 1149 Fulton street, Brooklyn, N. Y.

Asplin, John H., No. 227 Prospect street, Cleveland, O.

Athey, J. Howard, Holly Springs, Miss.

Atwood, Herman W., No. 846 Broadway, New York, N. Y.

Atwood, Luther L., No. 7 North street, Pittsfield, Mass.

Averill, William H., No. 435 Main street, Frankfort, Ky.

Babo, Leopold, No. 12 Boylston street, Boston, Mass.

Bailey, Frederick, P. O. Box 314, Lowell, Mass.

Bain, Andrew W., City Hospital, Cincinnati, O.

Baker, Edwin, Bridge Street, Shelburne Falls, Mass.

Baker, Grenville M, No. 487 Manhattan avenue, Greenpoint, Brooklyn, N. Y.

Baker, T. Roberts, No. 919 East Main street, Richmond, Va.

Baker, Walter T., 1201 Chestnut street, Philadelphia, Pa.

Bakes, William C., No. 145 North Tenth street, Philadelphia, Pa.

Ball, Charles E., No. 221 High street, Holyoke, Mass.

Ballard, John W., No. 106 West Second street, Davenport, Iowa.

Balluff, Paul, No. 632 Sixth avenue, New York.

Balser, Gustavus, No. 137 Avenue B, New York.

Baltzly, Zacharias T., Opera Block, Massillon, O.

Bartells, George C., Camp Point, Ill.

Bartlett, Nicholas G., N. W. cor. Twenty-third street and Indian avenue, Chicago, Ill.

Bartlet, William W., No 675 Shawmut avenue, Boston, Mass.

Bassett, Charles H., No. 504 Washington Street, Boston, Mass.

Bassett, John W., Tompkinsville, S. I., N. Y.

Bassett, Joseph, No. 119 Market street, Salem, N. J.

Bauer, Louis G., corner Fifth and Fairmount avenue, Philadelphia, Pa.

Baumgartner, Frederick, Chillicothe, O.

Baur, Jacob, Terre Haute, Ind.

Baxley, J. Brown, cor. Howard and Franklin streets, Baltimore, Md.

Bayley, Augustus R., No. 607 Main street, Cambridgeport, Mass.

Baylis, Lewis F., P. O Box 34, Jamaica, Queens county, L. I., N. Y.

Beach, Clifton H., cor. Shiloh and Sycamore streets, Pittsburgh, Pa.

Bechmann, Charles R., Fountain City, Wis.

Becker, Charles, No. 1367 Thirty-second street, West Washington, D. C.

Beckett, Frederick A., 529 Market street, San Francisco, Cal.

Beckman, Oscar A., No. 686 Broadway, cor. Baxter avenue, Louisville, Ky.

Bedford, P. Wendover, P. O. Box 1807, New York. N. Y.

Beebe, John Walter. Court and Plum streets, Cincinnati, O.

Behre, Charles H. E., Schumann's Pharmacy, Atlanta, Ga.

Belt, Z. James, No. 601 Market street, Wilmington, Del.

Bendiner, Samuel J., No. 47 Third avenue, New York, N. Y.

Benedict, James I., Pearl and Church streets, Cleveland, O.

Benedict, Willis, No. 303 Congress avenue, New Haven, Conn.

Benjamin, James H., No. 493 Tompkins avenue, Brooklyn, N. Y.

Berrian, George W., North Andover, Mass.

Best, John, No. 1 German Block, Central City, Col.

Betzler, Jacob, No. 121 Union street, Newark, N. J.

Beyschlag, Charles, La Crosse, Wis.

Billings, Henry M., No. 238 Greenwich street, New York, N. Y.

Bingham, Charles C., No. 5 Bank Block, Main street, St. Johnsbury, Vt.

Birchard, Abner T., Marshalltown, Iowa.

BIROTH, HENRY, No. 111 Archer avenue, Chicago, Ill.

Bishop, Francis M., Holley, Orleans county, N. Y.

Bissell, Emery G., Main street, Waterville, Oneida county, N. Y.

Bissell, John G., No. 45 Dominick street, Rome, N. Y.

BLACKMAN, LYMAN R., No. 167 Thames street, Newport, R. I.

Blahnik, Lorenz, No. 88 West Eighteenth street, Chicago, Ill.

Blaikie, William, No. 202 Genesee street, Utica, N. Y.

Blair, Andrew, cor. Eighth and Walnut streets, Philadelphia, Pa.

Blair, Henry C., cor. Eighth and Walnut streets, Philadelphia, Pa.

Blake, James E., No. 64 North Second street, New Bedford, Mass.

Blanding, William B., Nos. 54 and 58 Weybosset street, Providence, R. I.

Blank, Alois, No. 1353 South Fifth street, St. Louis, Mo.

Blatchford, Eben, No. 32 Main street, Rockport, Mass.

Blocki, William F., No. 85 South Clark street, Chicago, Ill.

Bochert, George, No. 87 Fifth street, McKeesport, Pa.

Bocking, Edmund, No. 1 Odd Fellows' Hall, Wheeling, W. Va.

Bodeker, Henry, cor. Fifteenth and East Main streets, Richmond, Va.

Boehm, Solomon, No. 800 Morgan street, St. Louis, Mo.

Boerner, Emil L., Clinton street, Iowa City, Iowa.

Boggs, Edwin L., Kanawha Bank Building, Charleston, Kanawha county, W. Va.

Bohl, Conrad, Watertown, O.

Bolles, William P., No. 571 Dudley street, Boston, Mass.

Bond, John B., Little Rock, Ark.

Borell, Henry A., No. 2043 Chestnut street, Philadelphia, Pa.

Boring, Edwin M., cor. Tenth street and Fairmount avenue, Philadelphia, Pa.

Borland, Matthew W., No. 378 West Van Buren street, Chicago, Ill.

Bower, Henry, cor. Gray's Ferry road and Twenty-ninth street, Philadelphia, Pa.

Bower, Henry A., cor. Sixth and Green streets, Philadelphia, Pa.

Bowker, James, cor. Sixth and Vine streets, Philadelphia, Pa.

Boyce, Snmuel F., Superior street and Third avenue, Duluth, Minn.

Boyd, George W., C street N. E., between Second and Third streets, Washington, D. C.

Boyden, Edward C., cor. of Joy and Myrtle streets, Boston, Mass.

Boynton, Herschell, No. 74 Main street, Biddeford, Maine.

Brack, Charles, cor. Ensor and Forrest streets, Baltimore, Md.

Brackett, Aurick S., No. 142 Montgomery street, San Francisco, Cal.

Bradfield, Louis H., cor. Decatur and Pryor streets, Atlanta, Ga.

Brant, Edmund W., 292 Broad street, Elizabeth, N. J.

Brewster, Wadsworth J., Hannibal, N. Y.

Bristol, Charles E., No. 48 Main street, Ansonia, Conn.

Brooks, Francis M., Baton Rouge, La.

Brooks, George W., No. 1161 Myrtle avenue, Brooklyn, N. Y.

Broughton, Albert J., No. 64 Dominick street, Rome, N. Y.

Brown, Albert P., cor. Fifth and Federal streets, Camden, N. J.

Brown, Henry J., No. 2 Main street, Ann Arbor, Mich.

Brown, Robert J., Leavenworth, Kan.

Browne, Clarence E., No. 39 Harrison avenue, Boston, Mass.

Browning, Woodville, Mound City, Mo.

Bruce, James, No. 544 Prospect street, Cleveland, O.

Bruck, Philip H., No. 24 N. High street, Columbus, O.

Bruguier, Francis, No. 557 Market street, Newark, N. J.

Brunner, Norman I., cor. Fourth and Arch streets, Macon, Ga.

Bryant, William C., Cedar Falls, Black Hawk county, Ia.

Buck, Albert B., Anderson, Ind.

Buck, George, S. W. cor. State and Madison streets, Chicago, Ill.

Buck, John, 267 Broadway, Chelsea, Mass.

Buck, John L., No. 267 Broadway, Chelsea, Mass.

Buehler, Edward H., No. 170 William street, New York, N. Y.

Buffington, Cyrus A., Hotel Block, Indianola, Ia.

Bullock, Charles, No. 528 Arch street, Philadelphia, Pa.

Bunker, Elihu, 403 Purchase street, New Bedford, Mass.

Buntin, William C., No. 600 Main street, Terre Haute, Ind.

Bunting, Samuel S., cor. Tenth and Spruce streets, Philadelphia, Pa.

Burdge, Jacob U., No. 482 Seventh avenue, New York, N. Y.

Burge, James O., Bowling Green, Ky.

Burley, Edwin P., No. 43 Temple Place, Boston, Mass.

Burnett, Joseph, No. 27 Central street, Boston, Mass.

Burnham, Edward S., Charleston, S. C.

Burns, J. Kellar, cor. Sunbury and Lecona streets, Minersville, Pa.

Burrough, Horace, Baltimore, Md.

Burroughs, Silas M., 8 Snow Hill, London, England.

Bury, Edward B., No. 412 Eighth street, S. E., Washington, D. C.

Bush, William, No. 56 Front street, Worcester, Mass.

Butler, Freeman H., No. 141 Central street, Lowell, Mass.

Butler, George F., Belle Plaine, Kan.

Button, Charles E., No. 1558 Wabash avenue, Chicago, Ill.

Cabell, George W., No. 211 Central avenue, Hot Springs, Ark.

Cahill, John F., No. 119 Main street, Johnstown, N. Y.

Calder, Albert L., No. 163 Westminster street, Providence, R. I.

Caldwell, James W., No. 242 Grand River avenue, Detroit, Mich.

Calvert, John, S. E. cor. Kearney and Clay streets, San Francisco, Cal.

Campbell, Horace W., No. 84 Front street, New York, N. Y.

Campbell, Hugh, cor. Twenty-first and Locust streets, Philadelphia, Pa.

Campbell, Isaac T., No. 239 West Broadway, Boston, Mass.

Campbell, John G., Corsicana, Texas.

Campbell, Samuel, No. 1412 Walnut street, Philadelphia, Pa.

Candidus, Philip C., cor. Dauphin and Cedar streets, Mobile, Ala.

Canning, Henry, 90 Green St, Boston, Mass.

Carle, John, Jr., No. 153 Water street, New York, N. Y.

Carpenter, Samuel W., Delhi, Hamilton county, O.

Carrell, Eugene A., Washington street, Morristown, N. J.

Carslake, George M., cor. Farnsworth and Church streets, Bordentown, N. J.

Carter, Solomon, No. 355 Washington street, Boston, Mass.

Caspari, Charles, Jr., cor. Fremont and Baltimore streets, Baltimore, Md.

Casper, Thomas J., No. 41 East Main street, Springfield, O.

Catlin, Ephron, cor. Sixth street and Washington avenue, St. Louis, Mo.

Chamberlain, Guilford T., St. Louis, Mo.

Chandler, Charles F., cor. Fourth avenue and Fiftieth street, New York. N. Y.

Chapin, Fred. H., Hartford, Conn.

Chapin, William A., cor. Beech and Lincoln streets, Boston, Mass.

Chapman, Isaac C., No. 111 Water street, Newburgh, N. Y.

Cherry, James B., No. 23 Fourth avenue, Pittsburgh, Pa.

Choate, John, No. 208 Main street, Fitchburg, Mass.

Christiani, Charles, No. 484 Pennsylvania avenue, Washington, D. C.

Clapp, Chambers B., No. 527 State street, Chicago, Ill.

Clark, Albert B., Jr., No. 9 Main street, Galesburg, Ill.

Clark, Frank P., North Baltimore, Wood county, O.

Clarke, William B., Stockbridge, Mass.

Clement, Henry B., Nos. 684 and 686 Broadway, Albany, N. Y.

Close, George C., 67 Cumberland street, Brooklyn, N. Y.

Cobb, Ralph L., No. 112 Superior street, Cleveland, O.

Coblentz, Virgil, No. 167 West Main street, Springfield, O.

Coffin, Samuel L., Hinckley, Ill.

Colcord, Joseph W., 153 Union street, Lynn, Mass.

Colcord, Samuel M., Dover, Mass.

Cole, H. W., Danville, Va.

Colgan, John, cor. Tenth and Walnut streets, Louisville, Ky.

Collins, Albert B., No. 48 Main street, Westerly, R. I.

Collins, Louis D., No. 280 Greenwich street, New York, N. Y.

Colton, James B , No. 766 Tremont street, Boston, Mass.

Cone, John W., No. 205 Genesee street, Utica, N. Y.

Conrath, Adam, No. 1330 State street, Milwaukee, Wis.

Cook, George E., No. 111 Pike street, Port Jervis, N. Y.

Cook, Thomas P., No. 838 North Ninth street, Philadelphia, Pa.

Coon, James V. D., 31 Union St., Olean, N.Y.

Cordon, John G. M., Aberdeen, Miss.

Cornell, Edward A., cor. Pine and Tenth streets, Williamsport, Pa.

Cotton, William H., Newport, R. I.

Coumbe, Oscar H., cor. Tenth and E streets, N. W., Washington, D. C.

Cowdin, George H., No. 25 Union Square, Somerville, Mass.

Cowdrey, Robert H., No. 527 State street, cor. Harmon court, Chicago, Ill.

Cox, David P., 801 Main street, Terre Haute, Ill.

Cramer, Max, No. 1336 Tremont street, Boston, Mass.

Crawford, Robert W., Fort Dodge, Ia.

Cressler, Charles H., cor. Front and Main streets, Chambersburg, Pa.

Crolius, Frank M., 13 Grand Avenue, Milwaukee, Wis.

Cromwell, Zachariah S., No. 480 Pennsylvania avenue, Washington, D. C.

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Crossman, George A., No. 2 Simond's Block, Brandon, Vt.

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Cummings, Theodore F., Scottdale, Westmoreland county, Pa.

Cunningham, A. P., Champaign, Ill.

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Davis, Edward H., Rochester, N. Y.

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De Huy, Bernard H., Second and Spruce streets, Abilene, Kan.

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Dedrick, W. Fred., Kingston, N. Y.

Deibert, Thomas I., No. 103 North Centre street, Pottsville, Pa.

Delavallade, Jean M., cor. Bank and Plaquemine streets, Plaquemine, La.

Deléry, Edgar, P. O. Box 19, Bay St. Louis, Miss.

Denham, Charles S., Main street, Rockland, Mass.

Dennin, Charles, 33 Court St., Brooklyn, N. Y.

Dick, Dundas, No. 37 Wooster street, New York, N. Y.

Diehl, C. Lewis, cor. Third street and Broadway, Louisville, Ky.

Dikeman, Nathan, cor. Leavenworth and Dikeman streets, Waterbury, Ct.

Dill, John B., Indianapolis, Ind.

Dinsmore, George F., No. 41 Park street, Worcester, Mass.

Ditman, Andrew J., No. 10 Astor House, New York, N. Y.

Dobbins, Edward T., No. 1414 Walnut street, Philadelphia, Pa.

Dohme, Charles E., cor. Pratt and Howard streets, Baltimore, Md.

Dohme, Louis, cor. Pratt and Howard streets, Baltimore, Md.

Dohmen, Peter L., 149 Reed street, Milwaukee, Wis.

Dodd, Simon W., Queen street, Charlottetown, P. E. I.

Doliber, Thomas, No. 41 Central Wharf, Boston, Mass.

Dougherty, Samuel E., No. 65 Brinkerhoff street, Jersey City, N. J.

Douglas, Henry, Jr., No. 68 Wythe avenue, Brooklyn, N. Y.

Drake, Charles W., No. 275 Main street, Middleboro, Mass.

Drake, Jonathan B., No. 132 Broad street, Elizabeth, N. J.

Drake, John R., No. 255 S. Water street, Milwaukee, Wis.

Drefs, Charles A., No. 166 Broadway, Buffalo, N. Y.

Dreher, Louis, No. 302 Euclid avenue, Cleveland, O.

Drew, John W., No. 901 Pennsylvania avenue, Washington, D. C.

Driggs, Charles M., White Haven, Pa.

Driggs, Nathaniel S., Indianapolis, Ind.

Drown, Lowell A., P. O. Box 102, Taunton, Mass.

Drury, Linus D, cor. Warren and Dudley streets, Boston, Mass.

Duble, Jesse B., cor. Pan and Fourth streets, Williamsport, Pa.

Dubois, William L., No. 281 Main street, Catskill, N. Y.

Du Puy, Eugene, 1150 Fulton avenue, Brooklyn, N. Y.

Duckett, Walter G., cor. Twenty-second street and Pennsylvania avenue, Washington, D. C.

Dudley, Oscar E., No. 62 E. One Hundred and Twenty-fifth street, New York, N. Y.

Dufour, Clarence R., No. 1814 Fourteenth street, Washington, D. C.

Dunn, John A., No. 56 Dougherty street, Brooklyn, N. Y.

Durban, S. C., Augusta, Ga.

Durkee, William C., Boylston and Berkeley streets, Boston, Mass.

Dykeman, George A., Catskill, N. Y.

Eareckson, Edwin, cor. Baltimore and High streets, Baltimore, Md.

Earnshaw, William J., No. 38 Huron street, Indianapolis, Ind.

Eastman, Charles S., N. E. cor. Main and Depot streets, Concord, N. H.

Easton, Luther W., Union near Webster street, Rockland, Mass.

Eberbach, Ottmar, No. 12 South Main street, Ann Arbor, Mich.

Eberle, Charles L., No. 4779 Germantown avenue, Philadelphia, Pa.

Eberle, Herman T., care G. E. Eberle & Son, Watertown, Wis.

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Eccles, Robert G., 94 Smith street, Brooklyn, N. Y.

Eckel, Augustus W., No. 231 King street, Charleston, S. C.

Eckert, Edwin G., Fred street, Hanover, Pa.

Eckford, Joseph Wm., Commerce street, Aberdeen, Miss.

Eddy, Henry C., cor. Eighteenth and Lombard streets, Philadelphia, Pa.

Eddy, Charles H., Main street, Great Barrington, Mass.

Edwards, Nathan W., Main street, Fairmount, Ind.

Edwards, William F., No. 334 East Baltimore street, Baltimore, Md.

Eger, George, Nos. 839 and 841 Central avenue, Cincinnati, O.

Eggers, Frederick H., No. 72 Ohio street, Allegheny City, Pa.

Eimer, Charles, No. 205 Third avenue, New York, N. Y.

Elbe, Constantine B., Park street, Alameda, Cal.

Elfers, Joseph C., No. 42 Budd street, Cincinnati, O.

Eliel, Leo, South Bend, Ind.

Elliott, Henry A., No. 286 Lexington street, Baltimore, Md.

Ellis, Evan T., No. 145 South Front street, Philadelphia, Pa.

Emanuel, Louis, cor. Second and Grant street, Pittsburgh, Pa.

Emerson, Charles B., cor. Merrimac and Bridge streets, Haverhill, Mass.

Emerson, Isaac E., cor. Gilmor street and Lafayette avenue, Baltimore, Md.

Emich, Columbus V., No. 136 North Howard street, Baltimore, Md.

England, Robert, No. 800 South Tenth street, Philadelphia, Pa.

Eschmann, F. W. R., Yonkers. N. Y.

Estes, Joseph, cor. Union and Church streets, Rockland, Mass.

Estey, Edwin M., Moncton, New Brunswick.

Evans, Hugh W., Delphos, O.

Evans, Joseph S., P. O. Box 657, West Chester, Pa.

Evans, Samuel B., Circleville, O.

Fairchild, Benjamin T., 60 Fulton street, New York, N. Y.

Feemster, Joseph H., No. 99 Walnut street, Cincinnati, O.

Feeny, James, Bay and Thompson streets, Stapleton, S. I., N. Y.

Feil, Joseph, Cleveland, O.

Fenner, William R., care of W. D. Hoyt & Co., Rome, Ga.

Fenton, Frank S., Beloit, Wis.

Ferdinand, George A., Dubuque, Ia.

Feth, Joseph G., cor. Madison and Columbia streets, Newport, Ky.

Fickling, Charles H., No. 1260 Thirty-second street, West Washington, D. C.

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Finkel, Charles E, No. 4 Main street, Yonkers, N. Y.

Finlay, Alexander K., New Orleans, La.

Finlay, John P., Greenville, Miss.

Fischer, Phil., No. 848 West Market street, Louisville, Ky.

Fish, Charles F., No. 104 Broadway, Saratoga Springs, N. Y.
Fisher, Amos S., Bergen, N. Y.
Fisher, John N., Odd Fellows' Hall, Morristown, O.
Fisher, William, No. 327 Bleeker street, New York, N. Y.
Fiske, Calvin J., 3640 Cottage Grove ave., Chicago, Ill.
Flanagan, Lewis C., No. 589 Somervile avenue, Somerville, Mass.
Fleck, Jacob J., cor. Washington and Perry streets, Tiffin, O.
Fleischmann, Augustus T., Sedalia, Mo.
Fleming, Frank B., No. 7 West Main street, Shippensburg, Pa.
Follansbee, Sherman, No. 549 Shawmut avenue, Boston, Mass.
Ford, James M., Kansas City, Mo.
Ford, W. Thomas, No. 1305 Cherry street, Kansas City, Mo.
Foster, William O., Simcoe, Ontario, Can.
Fougera, C. Edmund, cor. Broadway and Thirtieth street, New York, N. Y.
Foulke, James, No. 250 Washington street, Jersey City, N. J.
Fox, Daniel S., 323 Franklin street, Reading, Pa.
Fox, Peter P., No. 2300 Spruce street, Philadelphia, Pa.
Frames, James P., cor. Gray and Aisquith streets, Baltimore, Md.
Francis, Walter R., No. 170 Orange street, New Haven, Conn.
Franklin, Philip H., Marshall, Mo.
Fraser, Edward A., No. 20 College Place, New York, N. Y.
Fraser, Robert P., Water street, Pictou, Nova Scotia.
Frauer, Herman E., No. 246 East Washington street, Indianapolis, Ind.
Frazee, George B., No. 316 Curtis street, Denver, Col.
French, George W., No. 360 Washington street, Boston, Mass.
French, William B., No. 10 State street, Albany, N. Y.
Frere, Alexander G., Main street, Franklin, La.
Fries, Charles J. V., Main St., Anoka, Miss.
Frohwein, Richard, No. 122 First street, Elizabethport, N. J.
Frost, James, Nos. 169, 171, 173 Georgia street, Vallejo, Solano county, Cal.
Frothingham, Edward G., Jr., Elm street, cor. Main and Water, Haverhill, Mass.
Früh, Carl D. S., No. 2321 Ridge avenue, Philadelphia, Pa.
Frye, George G., No. 320 Congress street, Portland, Me.
Fuller, Henry W., No. 470 North State street, Chicago, Ill.
Fuller, Oliver F., No. 220 Randolph street, Chicago, Ill.
Gale, Edwin O., No. 85 South Clark street, Chicago, Ill.
Gale, William H., No. 85 South Clark street, Chicago, Ill.
Gallagher, Charles K., Second street, Washington, N. C.
Gallagher, John A., Kansas City, Mo.
Galt, Edward P., No. 34 Bond St., Selma, Ala.
Gardner, Charles H., New York, N. Y.
Gardner, Robert W., New York, N. Y.
Garrigues, Samuel S., Ann Arbor, Mich.
Garrison, Herod D., No. 3510 Vincennes avenue, Chicago, Ill.
Gates, Howard E., Litchfield, Conn.
Gates, Amasa O., Morrisville, Vt.
Gaus, Charles H., No. 202 Washington avenue, Albany, N. Y.
Gaus, Louis H., No. 254 South Pearl street, Albany, N. Y.
Gaylord, Henry C., No. 110 Monument square, Cleveland, O.
Gegelein, Frederick L., Payne and Case avenues, Cleveland, O.
Geier, Oscar W., No. 175 Main street, Carrollton, Ky.
Genois, Louis, No. 1412 Walnut street, Philadelphia, Pa.
George, Charles T., No. 1306 North Third street, Harrisburg, Pa.
Gerhard, Samuel, cor. Hanover and Belgrade streets, Philadelphia, Pa
Gessler, Max, 293 Pierce street, Milwaukee, Wis.
Gessner. Emil A., No. 301 Chapel street, New Haven, Conn.
Gibson, Charles, No. 74 State street, Albany, N. Y.
Gill, George P., P. O. Box 17, Mount Vernon, N. Y.

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Godding, Edward R., Bridge street, Eau Claire, Wis.
Godding, John G., cor. Berkeley and Boylston streets, Boston, Mass.
Goebel, Edward, 530 Main street, Louisville, Ky.
Gonaux, François, Houma, La.
Good, James M., No. 2348 Olive street, St. Louis, Mo.
Goodale, Harvey G., No. 207 Atlantic ave., Brooklyn, N. Y.
Goodale, Thomas T., No. 39 Tremont street, Boston, Mass.
Goodman, Charles F., No. 180 Farnham street, Omaha, Neb.
Goodman, Emanuel, cor. Sixth and Elm streets, Cincinnati, O.
Goodrich, Stephen, care of L. G. Moses & Co., Hartford, Conn.
Goodwin, Lester H., cor. State and Main streets, Hartford, Conn.
Goodwin, William W., Newburyport, Mass.
Gordon, William J. M., No. 142 Walnut street, Cincinnati, O.
Gorgas, George A., 6 Market square, Harrisburg, Pa.
Gorham, John R. jr., No. 79 Water street, Newburgh, N. Y.
Gosman, Adam J., cor. Charles and Mulberry streets, Baltimore, Md.
Graham, Willis H., No. 144 Main street, Zanesville, O.
Grahame, Israel J., cor. Twelfth and Filbert streets, Philadelphia, Pa.
Grandjean, Charles, No. 2828 North Fourteenth street, St. Louis, Mo.
Grandjean, Eugene, No. 2828 North Fourteenth street, St. Louis, Mo.
Grassly, Charles W., 287 West Twelfth street, Chicago, Ill.
Gray, Gilbert D., Glenwood, Mo
Gray, Henry R., No. 144 St. Lawrence Main street, Montreal, Quebec, Can.
Gray, William H., No. 1139 Market street, Wheeling, W. Va.
Green, Arthur L., Ann Arbor, Mich.
Greene, William R., 1 Westminster street, Providence, R. I.
Gregory, Edmund, Kent street, Lindsay, Ontario, Canada.
Greve, Theodore L., cor. John and Sixth sreets, Cincinnati, O.
Greyer, Julius, S. W. cor. Vine and Findlay streets, Cincinnati, O.
Griffith, Albert R., No. 33 Centre street, Oil City, Pa.
Griffith, Hiram E., Grant's Block, Niagara Falls, N. Y.
Griffith, William H., No. 146 Second ave., New York, N. Y.
Griswold, De Witt C., Evansville, Wis.
Gross, Edward Z., No. 119 Market street, Harrisburg, Pa.
Grossklauss, John F., cor. High street and Public Square, Navarre, O.
Grosvenor, Daniel P., Jr., No. 35 Main street, Peabody, Mass.
Grove, John E., No. 3326 Germantown avenue, Philadelphia, Pa.
Gundrum, George, Ionia, Mich.
Guy, George O., 428 West Van Buren street, Chicago, Ill.
Haag, Julius A., Denison House, Indianapolis, Ind.
Haass, G. Herman, No. 38 East Main street, Rochester, N. Y.
Haber, Louis A., No. 283 St. Clair street, Cleveland, O.
Hadley, Frank R., No. 64 North Second street, New Bedford, Mass.
Haenchen, Charles E., No. 3838 Haverford street, Philadelphia, Pa.
Hageman, James F. S., Washington street, New Madison, Darke county, O.
Haight, William B., care Lockwood & Haight, Bogardus, Stamford, Conn.
Hale, Frederick, Brooklyn, N. Y.
Hall, Charles E., Greenville, N. H.
Hall, Edwin B., Wellsville, Alleghany county, N. Y.
Hall, Marshall C., care Hall Brothers, Fredericksburg, Va.
Hallberg, Carl S. N., No. 25 Michigan avenue, Chicago, Ill.
Hamilton, Emil, No. 3037 Indiana avenue, Chicago, Ill.
Hance, Edward H., cor. Callowhill and Marshall streets, Philadelphia, Pa.
Hancock, Charles W., No. 3425 Spring Garden street, Philadelphia, Pa.
Hancock, John F., cor. Baltimore street and Broadway, Baltimore, Md.

Hanson, Dominicus, Central Square, Rochester, N. Y.

Hanson, Willis T., No. 195 State street, Schenectady, N. Y.

Harbers, William H., Laurens street, Aiken, S. C.

Hardigg, William L., Second near Main street, Uniontown, Ky.

Hardin, John H., Wilmington, N. C.

Harlow, Noah S., No. 4 Smith's Block, Bangor, Me.

Harper, Frank M., No. 45 East Main street. Madison, Ind.

Harper, Harry W., Fort Worth, Texas.

Harries, Oscar L., No. 263 Washington street, Buffalo, N. Y.

Harrington, Frank, Werland's Block, Main street, Logan, O.

Harrison, Jacob H., 305 Brady street, Davenport, Ia.

Hartshorn, Frederick A., Marlborough, Mass.

Hartung, Hugo R., No. 230 Fifteenth street, Denver, Col.

Hartwig, Charles F., Chicago, Ill.

Harwood, Frank L., Main street, Warren, Mass.

Hassebrock, Henry F., 1000 North High street, St. Louis, Mo.

Hassinger, Samuel E. R., N. E. cor. Fairmount avenue and Twenty-third street Philadelphia, Pa.

Hatch, Eugene F., Goldsboro, N. C.

Hattenhauer, Robert C., Peru, Ill.

Hatton, Edgar M., cor. Main and Fifth streets, Zanesville, O.

Hauenstein, William, Bluffton, O.

Haviland, Henry, New York, N. Y.

Hawkins, Henry, cor. Hastings and Brewster streets, Detroit, Mich.

Hawkins, Joseph T., N. W. cor. Dearborn and Minor streets, Mobile, Ala.

Hawkins, M. Smith, No. 20 Broadway, Salem, Columbiana county, O.

Hay, Henry H., cor. Free and Middle streets, Portland, Me.

Hayes, Horace P., No. 312 Elk street, Buffalo, N. Y.

Hays, David, No. 207 Division street, New York, N. Y.

Hazen, Peter P., Cornwall, Orange county, N. Y.

Heckler, George L., No. 774 Broadway, Cleveland, O.

Hegeman, J. Niven, 756 Broadway, New York, N. Y.

Heinemann, Otto, cor. Laurel and Lynn streets, Cincinnati, O.

HEINITSH, CHARLES A., No. 16 East King street, Lancaster, Pa.

Heintzelman, Joseph A., cor. Ridge avenue and Master street, Philadelphia, Pa.

Helman, Charles M., cor. Findlay and Baymiller street, Cincinnati, O.

Hemm, Francis, South St. Louis, Mo.

Henes, William F., No. 221 Randolph street, Chicago, Ill.

Henry, Charles (Dworniczak), Croton Landing, N. Y.

Hepburn, John, No. 93 Main street, Flushing, N. Y.

Herbst, Frederick W., Columbus, O.

Hermann, John G., cor. Baltimore and Mechanic streets, Cumberland, Md.

Herzfeld, Herman, 260 Seventh avenue, New York, N. Y.

Hessen, George A., No. 220 Poplar street, Memphis, Tenn.

Heuermann, Henry W., No. 120½ Claiborne avenue, Chicago, Ill.

Heun, Emil, Cincinnati, O.

Heydenreich, Emile, No. 169 Atlantic avenue, Brooklyn, N. Y.

Heyl, James B., Vice-Consul, Hamilton, Bermuda.

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Higgins, James S., No. 214 Delancy street, New York, N. Y.

Hildreth, Charles F., No. 54 Main street, Suncook, N. H.

Hildreth, Newton G., Cheviot, Cincinnati, O.

Hill, James W. H., Saugus, Mass.

Hilt, David, No. 84 Main street, Lafayette, Ind.

Hinsdale, Samuel J., Market Square, Fayetteville, N. C.

Hobart, Charles H., No. 10 Gold street, New York, N. Y.

Hodgetts, George, No. 305 Yonge street, Toronto, Ontario, Can.

Hoffmann, Frederick, No. 183 Broadway, New York, N. Y.

Hoffman, Otto L., cor. Fourth and Town streets, Columbus, O.
Hogey, Julius H., No. 441 State street, Chicago, Ill.
Hohenthal, Charles F. L., No. 857 Third avenue, New York, N. Y.
Hohly, Charles, No. 248 South St. Clair street, Toledo. O.
Holland, Samuel S., cor. Smithfield and Liberty streets, Pittsburgh, Pa.
Hollister, Albert H., 25 Pinckney street, Madison, Wis.
Holmes, Clayton W., No. 410 West Gray street, Elmira, N. Y.
Holmes, Henry E., No. 19 Main street, Walla Walla, Wash. Ter.
Holzhauer, Charles, No. 787 Broad street, Newark, N. J.
Hood, Charles I., cor. Merrimac and Central streets, Lowell, Mass.
Hopp, Lewis C., cor. Euclid avenue and Erie street, Cleveland, O.
Hopper, George S., Hume, Allegheny county, N. Y.
Horn, Wilbur F., No. 32 West Main street, Carlisle, Pa.
Hoskinson, J. Thomas, Jr., Front and Norris streets, Philadelphia, Pa.
Hostetter, Charles M., No. 272 Penn avenue, Pittsburgh, Pa.
Howson, Walter H., Water street, Chillicothe, O.
Hoyt, George M., No. 257 Columbus avenue, Boston, Mass.
Huber, Jacob C., No. 450 Main street, Fond du Lac, Wis.
Hubbard, John H., No. 468 Harvard street, Cambridge, Mass.
Hudnut, Alexander, No. 218 Broadway, New York, N. Y.
Hudson, Arthur, Centre street, Newton, Mass.
Huested, Alfred B., No. 77 Eagle street, Albany, N. Y.
Huhn, George, 123 Nicollet street, Minneapolis, Minn.
Hunt, Leonard W., Fourth St., Macon, Ga.
Hurley, John, Monroe street, Little Falls, Herkimer county, N. Y.
Hurt, James F , Broadway, Columbia, Mo.
Hurty, John N., No. 104 North Penn street, Indianapolis, Ind.
Huston, Charles, No. 43 South High street, Columbus, O.
Hutchins, Isaiah, M. D., West Acton, Mass.
Hutchison, Hazard S., Sunbury and Shamokin streets, Shamokin, Pa.
Ihlefeld, Conrad H., No. 715 Eighth avenue, New York, N. Y.
Imgard, Julius, No. 586 Sixth avenue, New York, N. Y.
Ingalls, Albert O., Murray, Shoshone county, Idaho.
Ingalls, John, cor. Fourth and Poplar streets, Macon, Ga.
Ink, Charles E., Columbiana, O.
Inman, Charles T., 1184 East Market street, Akron, O.
Irvin, William A., El Paso, Texas.
Jacobs, Joseph, Marietta and Peachtree streets, Atlanta, Ga.
Jacobus, Judson S., cor. Thirty-first street and Indiana avenue, Chicago, Ill.
Jackson, Edward C., 140 Freemason street, Norfolk, Va.
JACQUES, GEORGE W., cor. Broadway and Augusta street, S. Amboy, N. J.
James, George R., 120 Grand street, Schoolcraft, Mich.
James, William T., No. 103 Main street, Flushing, N. Y.
Jenkins, Luther L., No. 119 Leverett street, Boston, Mass.
Jenks, William J., No. 160 North Third street, Philadelphia, Pa.
Jennings, N. Hynson, No. 90 North Charles street, Baltimore, Md.
Jesson, Jacob, Western avenue and Jefferson street, Muskegon, Mich.
Johnson, Benjamin F., No. 301 East Girard avenue, Philadelphia, Pa.
Johnson, Charles B., Third street, Middletown, O.
Johnson, Horace J., 1 Rumford Building, Main street, Waltham, Mass.
Johnson, Stuart W., Toronto, Ontario, Can.
Johnston, William, Nos. 153 and 155 Jefferson avenue, Detroit, Mich.
Johnston, Harry A., 1001 O street, N. W., Washington, D. C.
Jones, Alexander H., Ninth and Parrish streets, Philadelphia, Pa.
Jones, Charles K., Leffingwell and Washington avenue, St. Louis, Mo.

Jones, Daniel S., Twelfth and Spruce streets, Philadelphia, Pa.

Jones, Edward C., S. E. cor. Fifteenth and Market streets, Philadelphia, Pa.

Jones, James T., No. 855 East Fourth street, Boston, Mass.

Jones, Simon N., First and Jefferson streets, Louisville, Ky.

Jones, Thomas, No. 1060 and 1062 Fulton street, Brooklyn, N. Y.

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Jordan, William H., Boston, Mass.

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Kalish, Julius, No. 409 Grand street, New York, N. Y.

Kannal, Emmet, Rensselaer, Ind.

Karb, George J., Fourth and Main streets. Columbus, O.

Karch Joseph L., Ninth and Cumberland streets, Lebanon, Pa.

Karrman, William, Cincinnati, O.

Kauffman, George B., No. 37 East Spring street, Columbus, O.

Keasbey, Henry G., No. 13 North Fifth street, Philadelphia, Pa.

Keck, William H., 277 Federal street, Allegheny City, Pa.

Keeler, William H., P. O. Box 585, Saginaw City, Mich.

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Keiper, Louis, 780 Lorain St., Cleveland, O.

Kelley, Edward S., Boylston and Berkeley streets, Boston, Mass.

Kellogg, Gardner, Mill and Commercial streets, Seattle, Wash. Ter.

Kelly, George A., Wood Street and First avenue, Pittsburgh, Pa.

Kennard, Frank W., No. 1312 Harney street, Omaha, Neb.

Kennedy, George W., No. 103 North Centre street, Pottsville, Pa.

Kennedy, Thomas, Broadway, New Brighton, Pa.

Kent, Henry A., Jr,, cor. E. Broad street and Jefferson avenue, Elizabeth, N. J.

Kent, Robert R., Opopka, Orange county, Fla.

Keppler, Christian L., No. 461 Dryades street, New Orleans, La.

Kerr, James, Jr., No. 402 Smithfield street, Pittsburgh, Pa.

Kessler, Edward F., cor. Twentieth and Market streets, Louisville, Ky.

Keys, Roger, Twelfth and Pine Streets, Philadelphia, Pa.

Kidder, Samuel, No. 35 Nesmith street, Lowell, Mass.

Kienth, Hans, No. 608 Mitchell street, Milwaukee, Wis.

Kimmel, Henry, No. 65 Avenue A, New York, N. Y.

King, James T., Main and South streets, Middletown, N. Y.

King, Walter B., No. 47 Austin avenue, Waco, Texas.

Kirchhofer, P. Paul, Massillon, Stark county, Ohio.

Kitchen, Charles W., cor. Fulton and Washington streets, Brooklyn, N. Y.

Klayer, Louis, Ninth and Elm streets, Cincinnati, O.

Klie, G. H. Charles, Bellefontaine Road, Lowell, N. St. Louis, Mo.

Kline, Mahlon N., Nos. 309 and 311 North Third street, Philadelphia, Pa.

Klump, Charles C., Allentown, Lehigh county, Pa.

Klussmann, Hermann, cor. Fourth street and Lafayette avenue, Hoboken, N. J.

Knabe, Gustavus A., No. 505 Pennsylvania avenue, N. W., Washington, D. C.

Knapp, Frank F., No. 362 Hudson street, New York, N. Y.

Knock, Thomas F., Petersburg, Va.

Knoebel, Edmund, Public Square, Highland, Ill.

Knoefel, August, New Albany, Ind.

Koch, Louis, cor. Fourth and Wood streets, Philadelphia, Pa.

Koehnken, Herman H., cor. Third and Mill streets, Cincinnati, O.

Krehbiel, Gustavus, No. 156 East Forty-eighth street, New York, N. Y.

Krepe, J. Theodore, 314 East Second street, Muscatine, Iowa.

Krewson, William E., 1829 North Eighth street, Philadelphia, Pa.
Krieger, Philip, cor. Myrtle and Marcey streets, Brooklyn, N. Y.
Kuerze, Robert M , N. W. cor. Eighth and Depot streets, Cincinnati, O.
Kuhn, Norman A., No. 124 South Fifteenth street, Omaha, Neb.
Kurfurst, Henry F., West Liberty, Logan county, O.
Laber, Julius, No. 874 Third avenue, New York, N. Y.
Lahme, Charles A., Kansas City, Mo.
Lambert, John A., No. 450 West Michigan street, Indianapolis, Ind.
Lammert, C. Joseph, No. 32 Milton street, Cincinnati, O.
Lancaster, Edwin W., Marshall, Tex.
Land, Robert H., No. 270 Broad street, Augusta, Ga.
Lander, John C., Yorkville, Toronto, Can.
Latimer, Robert F., Jackson, Mich.
Lauer, Michael J., No. 275 Mulberry street, Baltimore, Md.
Laurent, Eugene L., No. 27 Cedar street, Nashville, Tenn.
Lautenbach, Robert, cor. Eutaw and Saratoga streets, Baltimore, Md.
Lavigne, Jean B., No. 265 North Poydras street, New Orleans, La.
Lawrence, John H., Main and First streets, North Andover, Mass.
Lawton, Charles H., No. 91 Union street, New Bedford, Mass.
Lawton, Horace A., No. 91 Union street, New Bedford, Mass.
Lazell, Lewis T., No. 10 Gold street, New York, N. Y.
Lee, Addison S., 14 Fayetteville street, Raleigh, N. C.
Lee, James A., Main street, New Iberia, La.
Lehn, Louis, No 160 William street, New York, N. Y.
Lehr, Philip, 1145 Lorain street, Cleveland, Ohio.
Leis, George, No. 90 Massachusetts street, Lawrence, Kan.
Leist, Jacob L., Napoleon, O.
Leitch, Arthur, care of E. Shendell, St. Louis, Mo.
Leith, Harvey J., 282 North Main street, Providence, R. I.
Lemberger, Joseph L., No. 8 North Ninth street, Lebanon, Pa.
Lengfeld, Abraham L., cor. Gay and Stockbridge streets, San Francisco, Cal.
Levy, Adolph, No. 125 Grand street, E. D., Brooklyn, N. Y.
Lewis, Benjamin, No. 21 Canal street, New Orleans, La.
Lewis, Elam C., No. 2 West cor. Merchants' Row, Rutland, Vt.
Lewis, Samuel E., Fourteenth and P streets, N. W., Washington, D. C.
Libby, Henry T., Main street, Pittsfield, Me.
Lillie, Charles H., Main street, Great Barrington, Mass.
Lilly, Eli, No. 36 South Meridian street, Indianapolis, Ind.
Lincoln, Henry W., No. 185 Warren street, Boston, Mass.
Linden, Hugo F., Superior and Broad streets, Cleveland, Ohio.
Livingston, Barent V. B., No. 306 Broadway, Brooklyn, N. Y.
Llewellyn, John F., west side Public Square, Mexico, Adrian county, Mo.
Lloyd, John U., cor. Court and Plum streets, Cincinnati, O.
Lockhart, George B., cor. Thirty-second and O streets, West Washington, D. C.
Lockwood, Samuel A., cor. Broad and White streets, Red Bank, Monmouth county, N.J.
Lohman, George H., No. 1 Mitchell's Block, Kendallville, Ind.
Loomis, John C., cor. Chestnut and Wall streets, Jeffersonville, Ind.
Lord, Thomas, No. 72 Wabash avenue, Chicago, Ill.
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Loveland, William F., No. 213 Bread street, Elizabeth, N. J.
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Miller, Frederick C., cor. Clay and Market streets, Louisville, Ky.

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Miller. Jacob A., cor. Second and Chestnut streets, Harrisburg, Pa.

Miller, Jason A., Gloversville, N. Y.

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Parsons, Richard, No. 182 Ontario street, Cleveland, O.
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Perry, Frederick W. R., Detroit, Mich.

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Pettit, Henry M., Carrollton, Mo.

Pfingst, Edward C, cor. Third and Breckenridge streets, Louisville, Ky.

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Pfingst, Henry A., cor. Eleventh and Market streets, Louisville, Ky.

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Plummer, William P., Bradford, Stark county, Ill.

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Pollard, Frank W., Hot Springs, Ark.

Porter, Chelton S., Eminence, Ky.

Porter, Henry C., cor. Main and Pine streets, Towanda, Pa.

Porter, W. C., Greensboro, N. C.

Post, Elisha, cor. Main and Pine streets, Athens, N. Y.

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Powell, Thomas W., No. 10 Houston street, Fort Worth, Tex.

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Prentice, Frederick F., opposite Post Office, Janesville, Wis.

Prescott, Albert B., University of Michigan, Ann Arbor, Mich.

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Preston, Calvin W., No. 175 Market street, Galveston, Tex.

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Price, Charles H., Salem, Mass.

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Schuerman, Frederick, Cincinnati, O.

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Smith, Willard, Rochester, N. Y.

Smith, Willard A., Main street, Richfield Springs, N. Y.

Smithnight, Albert, No. 135 Woodland avenue, Cleveland. O.

Sniteman, Charles C., Neillsville, Wis.

Snively, Andrew J., Centre Square, Hanover, York county, Pa.

Snow, Charles W., No. 28 East Genesee street, Syracuse, N. Y.

Snow, Jesse W., No. 23 Charles street, Boston, Mass.

Snyder, Alva L., 33 Court Square, Bryan, O.

Snyder, Ambrose C., cor. Court and Atlantic avenue, Brooklyn, N. Y.

Sombart, John E., Coldwater, Kan.

Somers, Frank G., No. 125 State street, Chicago, Ill.

Somers, Richard M., Fifteenth and Oxford streets, Philadelphia, Pa.

Spalding, Warren A., No. 19 Church street, New Haven. Conn.

Spannagel, Charles C., No. 1607 Ridge avenue, Philadelphia, Pa.

Spenzer, Peter I., No. 88 Garden street, Cleveland, O.

Sperry, Herman J., No. 151 Chapel street, New Haven, Conn.

Spieth, William F., No. 273 Woodland avenue, Cleveland, O.

Spofford, Charles B., Claremont, N. H.

Squibb, Edward H., No. 36 Doughty street, Brooklyn, N. Y.

Squibb, Edward R., No. 36 Doughty street, Brooklyn, N. Y.

Stacey, Benjamin F., No. 51 Vine street, Charlestown, Mass.

Stahler, William, S. E. cor. Main and Swedes streets, Norristown, Pa.

Staley, Michael S., Indianapolis, Ind.

Stam, Colin A., Chestertown, Md.

Stamford, William H., No. 256 Mulberry street, Newark, N. J.

Stanford, William A.. Florence, Kan.

Stanford, James W., Cuthbert, Ga.

Stanley, E. C., No. 6 Beach avenue, Auburn, N. Y.

Starr, Thomas, No. 313 Ninth avenue, New York, N. Y.

Steele, Henry, N. E. cor. Turk and Taylor streets, San Francisco, Cal.

Steele, James G., No. 316 Kearney street, San Franaisco, Cal.

Stein, Jacob H., No. 803 Penn street, Reading, Pa.

Steinhauer, Frederick, Denver, Col.

Stevens, Alonzo B., Detroit, Mich.

Stevens, S. Henry, 627 Copeland street, Pittsburgh, Pa.

Stevens, Luther F., Atlantic avenue cor. Court street, Brooklyn, N. Y.

Stewart, Francis E., 721 South Twenty second street, Philadelphia, Pa.

Stierle, Adolph, No. 302 East Seventh street, St. Paul, Minn.

Stone, Clarence G., 580 Lafayette avenue, Detroit, Mich.

Stowell, Daniel, No. 1045 Washington street, Boston, Mass.

Strachan, William E., No. 619 Third ave. Brooklyn, N. Y.

Strassel, William, cor. Shelby and Broadway, Louisville, Ky.

Sturtevant, T. Frank, Wyandotte, Kan.

Sutton, Peter P., cor. Floyd and Market streets, Louisville, Ky.

Sweeny, Robert O., St. Paul, Minn.

Sweet, Abel S., Jr., No. 2 Main street, Bangor, Me.

Sweet, Caldwell, Bangor, Me.

Sweet, Frederick K., No. 2 Main street, Lockport, N. Y.

Sweet, William S., Randolph, Cattaraugus Co., N. Y.

Tartis, Alfred J., No. 268 Putnam avenue, Brooklyn, N. Y.

Taylor, Alfred B., No. 31 South Eleventh street, Philadelphia, Pa.

Taylor, James H., No. 104 Thames street, Newport, R, I.

Taylor, John P., No. 99 Third street, New Bedford, Mass.

Test, Alfred W., cor. Second and Federal streets, Camden, N. J.

Thatcher, Joseph H., No. 12 Market street, Portsmouth, N. H.

Thatcher, Hervey D., No. 12 Market Square, Potsdam, N. Y.

Thibodeaux, Joseph G., Main street, Thibodeaux, La.

Thackeray, William T., 1201 Arlington avenue. Davenport, Ia.

Thomas, George M., Derry Station, Pa.

Thomas, James, Jr., opposite Maxwell House, Nashville, Tenn.

Thomas, Oscar E., No. 123 Richardson street, Columbia, S. C.

Thompson, William B., No. 1700 Mount Vernon street, Philadelphia, Pa.

Thompson, William P., No. 5 West Baltitimore street, Baltimore, Md.

Thompson, William S., No. 705 Fifteenth street, Washington, D C.

Thompson, William S., No. 5 West Baltitimore street, Baltimore, Md.

Thomsen, John J., Nos. 14 and 16 German street, Baltimore, Md.

Thomsen, John J., Jr., No. 18 McCulloh street, Baltimore, Md.

Thomson, Edward W., No. 181 Main street, New Britain, Conn.

Thorn, Henry P., Medford, N. J.

Thornton, William E., cor. Baltimore and Harrison streets, Baltimore, Md.

Thorp, Abner, N. W. cor. Court and Plum streets, Cincinnati, O.

Thurber, Almon R., Salida, Col.

Tiarks, Hermann, First street, Monticello, Ia.

Tibbs, William H., No. 235 Main street, Buffalo, N. Y.

Tiernan, Frank M., Mansion House, Roselle, N. J.

Tilyard, Charles S., cor. Greene and Franklin streets, Baltimore, Md.

Tindall, Graham McF., No. 61 Commercial street, Aberdeen, Miss.

Tobey, Charles W., Troy, O.

Todd, Albert M., Nottawa, St. Joseph Co., Mich.

Todd, William J., 83 Centre avenue, Pittsburgh, Pa.

Tomfohrde, John W., cor. Benton and West Eighteenth streets, St. Louis, Mo.

Tooker, William W., Sag Harbor, N. Y.

Topley, James, No. 166 Georgia street, Vallejo, Solano county, Cal.

Toulson, Melbourn A., Chestertown, Md.

Tower, Levi, Jr., No. 1681 Washington street, Boston, Mass.

Townley, William W., No. 765 Broad street, Newark, N. J.

Trask, Charles M., White River Junction, Vt.

Treat, Joseph A., Stuart, Ia.

Trimble, Henry, 145 North Tenth street, Philadelphia, Pa.

Troth, Samuel F., No. 1019 Cherry street, Philadelphia, Pa.

Truax, Charles, Cedar Rapids, Linn county, Iowa.

Tscheppe, Adolph, No. 1010 Third avenue, New York, N. Y.

TUFTS, CHARLES A., No. 25 Washington street, Dover, N. H.

Turner, George H., No. 296 South Pearl street, Albany, N. Y.

Turner, Isaac W., No. 139 Wayne street, Jersey City, N. J.

Turner, T. Larkin, No. 3 Ashburton Place, Boston, Mass.

Tuska, David, Second avenue and Eighty-sixth street, New York, N. Y.

Twombley, John H., Masonic Block, Main street, New Market, N. H.

Ubert, Julius C., cor. Lee and Division sts., Brooklyn, N. Y.

Ude, George, 3610 N. Tenth st., St. Louis. Mo.

Uhlich, Ferdinand G , No. 1401 Salisbury street, St. Louis, Mo.

Underhill, George F., cor. Main and School streets, Concord, N. H.

Underhill, Joseph G., No. 397 Classon ave., Brooklyn, N. Y.

Underwood, Charles G., cor. Lewis street, and Maverick Square, Boston, Mass.

Urban, Jacob P., No. 336 Ontario street, Cleveland, O.

Van Alstyne, Franklin B., Kinderhook, N. Y.

Van Antwerp, Garet, No. 71 Dauphin St., Mobile, Ala.

Van Auken, Jerrie A., No. 125 Main street, Gloversville, N. Y.

Vandegrift, John A., No. 69 High street, Burlington, N. J.

Vandervoord, Ransford W., No. 482 Broad street, Newark, N. J.

Van Patten, William J, College street, Burlington, Vt.

Vansant, Robert H., 117 East State street, Trenton, N. J.

Van Winkle, Abraham W., No. 35 Clinton Avenue, Newark, N. J.

Vaughan, P. W., Durham, Orange county, N. C.

Vaupel, Charles P., Cleveland, O.

Vernor, James, No. 235 Woodward avenue, Detroit, Mich.

Viallon, Paul L., Park and Front streets, Bayou Goula, La.

Vickery, William H., cor. Central and Orchard streets, Dover, N. H.

Vilter, Herman, McMicken avenue and Locust street, Cincinnati, O.

Vincent, William, No. 117 Broadway, Brooklyn, E. D., N. Y.

Vordick, August H., S. E. cor. Jefferson avenue and Benton street, St. Louis, Mo.

Voss, George W., Eighth and Depot streets, Cincinnati, O.

Wackerbarth, John, cor. Sands and Bridge streets, Brooklyn, N. Y.

Wagner, Henry, cor. Fourth and Elm streets, Cincinnati, O.

Wahmhoff, Julius H., Delphos, O.

Walbrach, Arthur, Denver, Col.

Walker, Anselle, Freehold, N. J.

Walker, Charles, Hannibal, Mo.

Walker, Francis W., Jr., New Brighton, Pa.

Walker, George, Girard, Kan.

Walker, John P., Freehold, N. J.

Walker, William J., No. 74 State street, Albany, N. Y.

Wall, Otto A., 2111 Columbus street, St. Louis, Mo.

Walch, Robert H., No. 1412 Walnut street, Philadelphia, Pa.

Walton, Harry C., Laurel and Cutter sts., Cincinnati, O.

Walton, Joseph, Washington, D. C.

Wangler, Conrad D., Eastside, Waterloo, Ia.

Wanier, George S., No. 407 Eighth avenue, New York, N. Y.

Wardell, Robert C., Battle Creek, Mich.

Warder, Robert B., Purdue University, Lafayette, Ind.

Warne, Henry L., Mitchell, Dak. Ter.

Warner, William R., No. 1228 Market street, Philadelphia, Pa.

Warren, Mrs. Ella F., Belleville, Richland county, O.

Watjen, Herman J., Vincennes, Ind.

Waugh, George J., Stratford, Ontario, Canada.

Weaver, Charles A., cor. Fifth and Walnut streets, Des Moines, Ia.

Weaver, John A., No. 334 Northampton street, Easton, Pa.

Webb, John A., No. 210 Madison avenue, Baltimore, Md.

Webb, William H., No. 556 North Sixteenth street, Philadelphia, Pa.

Webber, Joseph T., cor. Main and State streets, Springfield, Mass.

Weber, William, cor. Fifteenth and Thompson streets, Philadelphia, Pa.

Webster, Stephen, No. 63 Warren avenue, Boston, Mass.

Wehrly, Thomas M., No. 72 G street, N. W., Washington, D. C.

Weichsel, Franz, La Porte, Ind.

Weidemann, Charles A., No. 563 North Twenty-second street, Philadelphia, Pa.

Weills, William M. L., 332 Broad street, Harrisburg, Pa.

Weinman, Oscar C., No. 173 Seventh avenue, New York, N. Y.

Weiser, Albert, cor. St. Paul and Main streets, St. Paul, Minn.

Weiser, Emilius I., Decorah, Ia.

Welch, Leonard E., cor. Broad and Washington streets, Albany, Ga.

Wellcome, Henry S., No. 8 Snow Hill, London, England.

Wells, Ebenezer M., Houston street, Fort Worth, Texas.

Wells, Jacob D., cor. Fourth street and Central avenue, Cincinnati, O.

Wells, Romanta, No. 297 State street, New Haven, Conn.

Wendell, Henry E., cor. Third and George streets, Philadelphia, Pa.

Wenzell, William T., No. 852 Market street, San Francisco, Cal.

West, Howell F., Main street, Fayette, Miss.

Westmann, F. H., No. 2744 Cass avenue, St. Louis, Mo.

Weusthoff, Otto S., No. 212 East Third street, Dayton, O.

Whall, Joseph S., No. 82 Hancock street, Quincy, Mass.

Wharton, John C., No. 38 Union street, Nashville, Tenn.

Wharton, William H., No. 38 Union street, Nashville, Tenn.

Wheeler, C. Gilbert, No. 81 Clark street, Chicago, Ill.

Wheeler, Leonard H., No. 78 State street, Albany, N. Y.

Wheeler, Lucien F., Waldo, Fla.

WHITE, AARON S., No. 59 High street, Mount Holly, N. J.

White, George H., cor. Newark and Jersey avenues, Jersey City, N J.

White, Philip A., No. 102 Gold street, New York, N. Y.

WHITFIELD, THOMAS, No. 240 Wabash avenue, Chicago, Ill.

Whiting, Frederick T., Main street, Great Barrington, Mass.

Whitman, Nelson S., No. 3 Merchants' Exchange, Nashua, N. H.

Whitney, Henry M., 29 Essex street, Lawrence, Mass.

Wichelus, Frederick, Bowery and Fourth street, New York, N. Y.

Wickham, William H., No. 91 Fulton street, New York, N. Y.

Wiegand, Thomas S., No. 4 South Thirty-eighth street, Philadelphia, Pa.

Wienges, Conrad, cor. Coles and Fourth streets, Jersey City, N. J.

Wigert, Carl R., No. 213 Jefferson street, Burlington, Iowa.

Wilcox, Frederick, Apothecaries' Hall, Exchange Place, Waterbury, Conn.

Williams, Alfred N., 93 Market street, Parkersburg, W. Va.

Williams, Doane B., 16 Lincoln Square, Worcester, Mass.

Williams, John K., No. 391 Main street, Hartford, Conn.

Williams, Richard W., Notre Dame street, Three Rivers, Quebec, Can.

Williams, William H., No. 659 Main street, Wheeling, W. Va.

Williamson, Edward J., Ninth and Franklin streets, St. Louis, Mo.

Wilson, Albert H., Penn street and Frankstown avenue, Pittsburg, Pa.

Wilson, Benjamin O., No. 28 Merchants' Row, Boston, Mass.

Wilson, Frank M., No. 133 Main street, Willimantic, Conn.

Wilson, Julius H., No. 125 Twenty-second street, Chicago, Ill.

Wilson, William, No. 106 Broadway, cor. Pine street, New York, N. Y.

Winkleman, John H., cor. Liberty and German streets, Baltimore, Md.

Winslow, Edwin C., No. 107 Main street, Danville, Ill.

Winslow, Samuel W., No. 33 Kingston street, Boston, Mass.

Winter, Jonas, No. 81 West Franklin street, Hagerstown, Md.

Wiseman, Henry A., Main St., Danville, Va.

Wohlfarth, Justin, No. 2002 Third avenue, New York, N. Y.

Wolfe, Nathaniel, No. 213 Market street, Wilkesbarre, Pa.

Wolff, Lawrence, No. 333 South Twelfth street, Philadelphia, Pa.

Woltersdorf, Louis, No. 171 Blue Island avenue, Chicago, Ill.

Wood, Edward S., No. 14 Chauncey street, Cambridge, Mass.

Wood, Mason B., East Providence, R. I.

Woodbridge, George W., No. 2 Faneuil Hall Square, Boston, Mass.

Woodruff, Roderick S., No. 91 Blank street, Waterbury, Conn.

Woodward, Samuel M., No. 91 North Charles street, Baltimore, Md.

Wooldridge, Napoleon, Cedar Key, Fla.

Worthington, J. Willits, Moorestown, N. J.

Wrampelmeier, Theodore J., Ann Arbor, Mich.

Wright, Archibald W., cor. Front and Market streets, Philadelphia, Pa.

Wynn, William, No. 496 Fulton street, Brooklyn, N. Y.

Yatman, John L., Orange Valley, N. J.

Yeakel, Nathan W., Nos. 107 and 109 Columbia street, Lafayette, Ind.

Yorston, Matthew M., No. 429 Central avenue, Cincinnati, O.

Young, Alexander N., No. 103 Sixteenth street, Wheeling, W. Va.

Young, William, 114 Park avenue, Rich Hill, Mo.

Young, Judson J., Kansas City, Mo.

Zaegel, Max R., Eighth street, Sheboygan, Wis.

Zahn, Emil A., No. 1801 State street, Chicago, Ill.

Zeilin, John H., No. 306 Cherry street, Philadelphia, Pa.

Zeller, William S., Bellefonte, Centre county, Pa.

Zellhœfer, George, No. 91 Fulton street, New York, N. Y.

Ziegler, Philip M., No. 526 Penn street, Reading, Pa.

Zimmerman, Charles, Peoria, Ill.

Zimmerman, John L., cor. Arch and Ray streets, Searcy, Ark.

Zoeller, Edward V., Tarboro, N. C.

Zwick, George G., cor. Eleventh and Meridian streets, Covington, Ky.

LIST OF RESIGNATIONS.

Name.	Residence.	Elected.
§ Addington, William B.,	St. Louis, Mo.,	1878
§ Brewer, Percival,	Reseville, Ill.,	1881
§ Bullard, George S.,	Utica, N. Y.,	1874
§ Foland, Daniel J.,	Wilmington, Ohio,	1881
§ Gaillard, Edward,	Philadelphia, Pa.,	1876
‡ Graham, William H.,	Sandusky, O.,	1876
§ Griffith, Alphonso D.,	Oil City, Pa.,	1879
‡ Heimstreet, Edward B.,	Janesville, Wis.,	1874
‡ Henderson, John,	Toronto, Ont.,	1877
§ Laird, William R.,	Jersey City, N. J.,	1867
§ Lins, Albert H.,	New York, N. Y.,	1881
§ McCullough, William T.,	Wheeling, W. Va.,	1880
* Reule, John,	Lafayette, Ind.,	1882
‡ Robinson, Frederick,	Kenosha, Wis.,	1881
§ Springer, William T.,	Louisville, Ky.,	1882
§ Thompson, Ebenezer R.,	Titusville, Pa.,	1882
§ Thomson, William M.,	Philadelphia, Pa.,	1883
§ Troupe, Theodore,	Springfield, O.,	1881

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‡ Inability to attend the meetings.
§ No reason given.
* Left the business.

LIST OF DECEASED MEMBERS.

Since the last meeting, notice of the death of the following members has been received:

Francis M. Bassett,	Brooklyn, N. Y.,	Elected	1860
Ira W. Blunt,	Richmond, Va.,	“	1873
H. Sugden Evans,	Montreal, Can.,	“	1880
Charles Faust,	Cincinnati, O.,	“	1879
Junius Gridley,	New York, N. Y.,	“	1853
George E. Knight,	Bath, N. Y.,	“	1880
Edward T. Meyers,	Bethlehem, Pa.,	“	1867
Jefferson Oxley,	Nicholasville, Ky.,	“	1878
Henry Sweet,	Chicago, Ill.,	“	1865
Edward S. Wayne,	Cincinnati, O.,	“	1854

INDEX.

A.

Abies balsamea, Hudson's Bay, 101
Abrus precatorius, histology of seed 181
seed as weight in India, 181
for preparation of poisonous spikes, 181
Abstracts (Coblentz), 424
Abstractum aconiti, 425
jalapæ, 426
nucis vomicæ, 427
Aburana (Brassica), Japan, 282
Abuta rufescens, Brazil, 102
Abutua, Brazil, 102
Acacia homalophylla, character of wood, 185
Acetone contains an alkaloidal substance, 288
removed from methylic alcohol, 272
Acetum camphoratum, 59
carbolisatum, 59
fumale excelsior, 59
stomaticum, 59
Acetyl cinchonamine, 304
Acid, aceticum aromaticum, 59
carbolisatum, 60
aconiticum, action on the heart, 315
arsenious, action upon glycerin, 247
benzoicum, accompanying substances, 289
as antiseptic, 444, 445
formation of, 289
preparation of, 291
boric, for preserving food, 236
as antiseptic, 444
butyric in wood of Eperua falcata, 289
caffeic from coniine and conhydrine, 295
carbolic, liquefaction of, 274
detection in creosote, 276
as test for nitric acid, 214
estimation of phenol in commercial, 274
solubility in paraffin and benzin, 275, 276
in indigestion, 276
in intermittent fever, 276
carbonic, collection of solid, 238
apparatus for determination, 238
cathartic, isolation and character, 345
contains neither N nor S, 347
cathartogenic, 347
chebulinic, 176
chrysophanic, does not pre-exist, 119
cinnamic, preparation from storax, 290
citric, detection of tartaric acid, 292
crescentinic, 122
ergotic, 102
formic as antiseptic, 288
hydriodic, preparation with phosphorus and paraffin, 227, 252
hydrobromic, preparation from bromide of zinc, 226
preparation with phosphorus and paraffin, 226, 252
proper doses, 227
hydrocyanic, determination, 238
picric acid as test, 238
hydrosulphuric, arsenic free, 211
from sulphide of magnesium, 212
jalapinolic, constitution, 347
methyl-paracoumaric, 112
nitric, determination of free, 215
carbolic acid as test, 214
diphenylamine as test, 216
Acid, nitrous, in distilled water, 211
para-amido-benzol-azodimethyl-aniline as test, 214, 340
carbolic acid as test, 214
naphthylamine as test, 215
oleic, 466, 467
orthoxyphenyl-sulphurous, 99
osmic, hypodermic use, 251
phosphoric, commercial, 235
dilute, decomposition, 434
fungi of, 440, 446
determination in fertilizers, 233
phytolacca decandra (volatile), 120
picric, detection in iodoform, 294
as test for albumen, 352
hydrocyanic acid, 238
polygonic (Rademaker), non-existence of, 115
quassic, constitution, 342
salicylic, manufacture, 291
as antiseptic, 444
influence on fermentation, 291
shikiminic, 162
sphacelic, 102
stearic, examination, 200
sulphhydric (See ac. hydrosulphuric.)
sulphindigotic as indicator, 239
sulphuric, contaminated with mercury, 219
from pyrites, 219
monohydrated, spec. grav., 219
sulphurous, strength of aqueous solution, 217
titration, 218
tannic, examination, 296
function in plants, 295
iodized, as test for alkalies, 240
tartaric, estimation in wines, 293
detected in citric acid, 292
Acids, mineral, detection in vinegar and wine, 221
in solid form, 220
organic, 288
Acolyctine, source of, 153
Aconine, 153, 314
Aconite, alkaloids, constitution, 314
action on the heart, 315
Aconitine, constitution, 314
action on the heart, 315
reduces silver salts, 315
Aconitum ferox, alkaloids, 314
Lycoctonum, alkaloids, 153, 316
Napellus, alkaloids, 314
Acorus Calamus, Hudson's Bay, 101
Adenanthera pavonia, seeds as weight, 183
Albrecht, Emil, deceased, 532
Albumen, pure, preparation, 352
picric acid as test, 352
comparison of tests, 352
Albuminoids, 352.
Alchemilla arvensis, as diuretic, 179
Alcohols, 266
drug market, 363
ferment, new, 353
fermentation, influence of salicylic acid, 291
absolute, fallacy of tests, 266
methylic, removal of acetone, 272
Aleurites cordata, 284
Algæ in solutions, 429, 431, 433
Alkaloids, influence of deposits on solutions of, 297
Alkalies, iodized tannic acid as test, 240
Alkalimetry, indicators—
aniline blue, 239
galleïn, 339
indicators, lakmoid, 351

- Alkalimetry phenolphthaleïn, 338
  - sulphindigotic acid, 239
  - Gawalovski's compound, 240
- Almecega (Proteum), Brazil, 102
- Alnus viridis, Hudson's Bay, 101
- Aloes, detection in pharm. preparations, 106
  - estimation, 106
  - solubilities, 106
  - fossil in England, 108
- Aloin, yield, 347
- Alpinia officinarum, analysis of root, 111
- Alpinin, 111
- Alpinol, 257
- Alum, burnt, quick solution, 242
- Aluminium, soldering, 242
- Alveloz in cancer, 190
- Amaranthaceæ, 120
- Amelliky (sarcocephalus), 145
- Ammonium, 241
  - bromide, medicinal value, 226
  - carbonate, drug market, 363
  - hydrate, existence denied, 241
- Amomaceæ, 111
- Amyl nitrite, administration, 272
  - antidote to strychnine, 272
- Amylase, 358
- Analysis—
  - by capillarity, 39
  - "drop" method, 38
  - upon glass, 39
  - volumetric (Jasscy), 38
- Anchietea salutaris, Brazil, 102
- *Anderson, G. H.*, address of welcome, 512
- Andromeda Leschenaultii, Nilgiris, 135.
- Anemone, species (Lloyd Bros.), 149
- Angrio vermelho (Piptodenia), 102
- Angostura alkaloids, 164
- Animal drugs, 198
- Annatto, constituents, 174
- Antibacteride, 98
- Antimony, black, of commerce (Warder), 479
- Antipyrin, constitution and source, 336
  - produces exanthemata, 337
- Antiseptics, comparative value, 442
- Antiseptin, 98, 99
- Apocynum hypericifolium, Hudson's Bay. 101
- Apomorphine, medicinal uses, 299
  - formed in solution of morph. muriat., 299
- Apparatus, 33
- Aqua. (See Water.)
- Aquifoliaceæ, 190
- Araliaceæ, 148
- Arbutin, preparation, 342
  - in Rhododendron maximum, 136
- Arbutose, preparation, 343
- Arctic vegetation (Kennedy), 495
- Aristolochiaceæ, 113
- Arradiabo (Cnidoscalus), Brazil, 102
- Arsenic, 247
  - (See Acid, arsenious.)
- Artanthe mollicoma, Brazil, 102
- Artemisia gallica, analysis, 137
- Asaron, constitution, 113
- Asarum europæum, analysis, 113
- Asclepiadaceæ, 133
- Asclepias incarnata, medicinal uses, 133
- Aseptol, 99
- Aspidosperma peroba, Brazil, 102
- Associations accrediting delegates, 613
  - receiving Proceedings, 616
- Associations, State Pharmaceutical, meetings, 26
  - Alabama, 28
  - Connecticut, 27
  - Georgia, 27
  - Illinois, 27
  - Indiana, 28
  - Iowa, 28
  - Kentucky, 29
  - Louisiana, 30
  - Maryland, 29
  - Massachusetts, 31
  - Michigan, 26
  - Mississippi, 29
  - Missouri, 32
  - Nebraska, 29
  - New Hampshire, 27
- Associations, New Jersey, 30
  - New York, 32
  - Ohio, 30
  - Pennsylvania, 31
  - Texas, 29
  - Virginia, 29
  - West Virginia, 32
- Asthma, pyridine in, 336
- Atropine, identical with daturine, 318
  - stable solution, 316
  - and mercuric chloride, 317
  - salicylate, superior to the sulphate, 317
    - neutral, 316
- Avogado pear contains perseite, 114
- Azedinha grama (Oxalis), Brazil, 102

B.

- Baccharis genistelloides, Brazil, 101
- Bacteria, 430, 431
- Balsam copaiba (See Copaiba.)
  - Peru, spec. grav., 180
- Barbatimão (Stryphnodendron), Brazil, 102
- Barium, permanganate, preparation, 243
- Bark (See Cinchona.)
- Barley, analysis, 104
- *Bartlet, W. W.*, assaying tincture of opium, 446, 566
- Bartung, origin, 120
- Bassia longifolia, analysis of seed, 133
- Baunilha do Rio, Brazil, 102
- Baycuru (Statice), Brazil 121
- *Bedford, P. W.*, menthol cones of commerce, 470
  - calomel of commerce, 477
  - chloroform of commerce, 492
  - imported menthol, 504
- Beef, iron and wine, 611
- Beet root, formation of sugar, 286
- Belladonna, cultivation, 127
  - value of cultivated and wild, 126
  - root, Japanese, constituents, 128
- Belladonnine, action of alkalies, 318
  - purification, 317
- Benzin, gelatinized, 81
- Benzoyl-aconine, 314
- Benzoin, Siam, new constituent, 134
- Berberidaceæ, 164
- Berberine, salts of, 150
  - yield from hydrastis, 151
  - bisulphate, 321
  - sulphate, 321
- Betaine in cotton-seed, 333
- Beurre d'Iris, 255
- Bismuth, atomic weight, 248
  - drug market, 363
  - and pepsin in solution, 79
  - salicylate. variable composition, 292
  - subnitrate, as surgical dressing, 247
- Bisulphites, action on chlorates, 222
- Bitter pepper root (calamus), 101
- Bitter tea (kalmia), 101
- Bixaceæ, 172
- Blackberry leaves as tea, 179
- Blowpipe reagent, tincture iodine as, 96
- Blue, aniline, in alkalimetry, 239
- Blue grass (chrysopsis), 136
- *Bocking, Edmund*, elixir of calisaya bark, 454
- Bois piquant (xanthoxylum), analysis, 166
- Boldoa fragrans contains a glucoside, 194
- Bond, Jos. R., deceased, 534
- Borax, drug market, 364
  - for copaiba pills, 81
- Boron, 236
- Bowdichia major, alkaloid of, 183
- Brassica campestris, B. sinensis, oil of, 282
- Brazil, medicinal plants, 102, 103
- Bread, native of Australia, 103
- Bromeliaceæ, 109
- Bromine for bleaching sponges, 199
  - as disinfectant, 225
  - manufacture in Ohio, 223
  - detected in presence of chlorine and iodine, 228
- Bromoform, preparation by electrolysis, 270
- Brucine, microscopically in the seed, 313
- Bryony, black, poisoning by berries of, 109
- Buchuiha (Luffa), Brazil, 102
- Burdock, analysis of fruit, 137

Burette (Fiebag); 37
  (Greiner), 37, 38
  (Vogtherr), 36, 37
  specific gravity, 35
  screw-clamp for, 36, 37
  stopcock for, 37
Butyrospermum Parkii, 134
Buxus sempervirens, new alkaloid, 193
By-Laws of the Association, 620
    amendments to, acted on, 550, 551
  of the Council, 628
    amendments acted on, 539, 551, 553, 554, 557

C.

Caffeine, physiological effects, 333
  is not dissipated in roasting, 71
  double salts of, 332
  in Ilex Cassine, 190
  per cent. in coffees of commerce, 332
    in Brazilian coffee, 143
    in roasted coffee, 144
    in teas of commerce, 331
  sodium benzoate, 332
    salicylate, 332
Cajeputol, identical with cyneol, 253
Cake white, 100
Calcium, 241
  sulphide, different processes, 217
  tartrate, estimation, 294
Caldwell, James W., coloring of elixirs, 452
Calomel of commerce (Patch), 476
    (Bedford), 477
Calycanthus lævigatus, use in the South, 177
Caltha palustris (Lloyd Bros.), 150
Camellia japonica, C. oleifera, oil of, 283
Camphor, drug market, 364
  as antiseptic, 444
  Baros, commercial qualties, 114
  lime (citroptene), 258
  matico, properties, 260
  orris-root, yield, 255
  oils, natural, 259
  phenol, medicinal value, 276
  ice, 62
Canary-seed, drug market, 368
Canavalia gladiata, Brazil, 101
Candlefish oil, 204
Cannabine, preparation, 333
Cannabis indica, constituents, 193
    as local anæsthetic, 193
Canquoin's paste, 98
Cantharides, determination of cantharidin, 199
Capparidaceæ, 172
Capparis coriacea in epilepsy, 172
Capsaicin, 257
Caramel, detection of paraldehyde, 287
Carbohydrates, 284
Carbon, 237
  diffusibility through porcelain, 237
Carbonic oxide, solidifying point, 207
Cardamoms, drug market, 368
Carica Papaya, 357
Carotin in annatto, 174
Carqueja amargosa (Baccharis), Brazil, 101
Caryophyllaceæ, 175
Cascara sagrada, 188, 497
Cassia Absus, use of seed, 184
  occidentalis, seeds as coffee, 184
Castanha de cera (Pachira), Brazil, 101
Cataplasmata, 61
Cedrela Vellosiana, Brazil, 102
Cedro vermelho, Brazil, 102
Cement, resists heat and acids, 58
  for mortars and pestles, 58
  transparent, 58
Centennial Fund, order on, 539, 581.
Cephalina esculenta, source of Doundaké bark, 145
Cerate, subacetate of lead, 62
Cerates, benzoinated, 61
  (See Ointment)
Ceresin, examination, 200
Chairamidine, 305
Chairamine and salts, 304, 305
Charcoal, animal, purified, 237
Chaulmoogra, histology of seed, 172, 174
Chemical food, 610
Chemist and Druggist, proposition from, 524
Chemistry, 472
Chichem, 184
Chicory and dandelion (Feil), 496
Chinizine, 336
Chinoidine, purified, 311
Chloral hydrate, action on metals, 272
    preparation, 271
    as vesicant, 272
Chlorates, test in presence of bromides and nitrates, 221
Chlorine, test in presence of bromine and iodine, 228
Chloroform, prepared by electrolysis, 270
    commercial (Bedford), 492
    hydrate, 270
Chlorophyll, causes of change in color, 349
    preparation, 349
Chocolate, analysis of commercial, 63.
Cholera powder (East Ind. vegetable), 83
Choline in hops, 334
  relation to ptomaines, 334
Chrysophan, 119
Chrysopsis graminifolia, uses in South, 136
Ch'ung shu, source of insect wax, 201
Cimicifuga racemosa, analysis of root, 153
Cinchona, collection in Java, 141
  coppicing, 139
  curing, 139
  cultivation in Bolivia, 140
    in Ceylon, 138
  drug market, 369
  fats and wax of, 281
  harvesting, 139
  planting, 138
Cinchona cuprea, 142
  Hakgale, 138
  "pata," 142
  rosulenta, contains dicinchonine, 310
  succirubra, analysis, 142, 143
    contains dicinchonine, 320
  "tega" ("tile"), 142
Cinchonamine and salts, 303, 304
    physiological action, 305
    as test for nitrates, 216
Cinchonidine, sulphate, drug market, 365
Cipó de chumbo (Cuscuta), Brazil, 101
  suma (Anchietea), Brazil, 102
Citroptene, 258
Clematis spec. (Lloyd Bros.), 148
Cnidoscolus neglectus, Brazil, 102
Coalfish oil, 204
Coblentz, V., abstracts, 424
Coca, commercial condition, 170
Cocaine, account of, 321, 323, 327
  in surgery as a local anæsthetic, 330, 331
  assay, 325
  constitution, 323
  antagonistic to morphine, 330
  solutions preserved, 327
    old, dangerous, 327
  preparation (Lossen), 322
    (Niemann), 321
    (Squibb), 323, 324
  suppositories, 330
  hydrochlorate, preparation, etc., 324, 325, 327, 328, 330
    fungi of solution, 444
    hypnotic value, 329
    in tubercular diseases, 331
  oleate, preparation, 324, 325, 330
Coffee, p. c. of caffeine, 332
  Brazilian, 143
  roasting, 332
    p. c. of caffeine, 144
Coins, assay of nickel, 244
Colchicine, crystallized, 319
Cold cream, rational (Unna), 61
Colleges accrediting delegates, 613
Collinsonia canadensis, analysis, 129
Cologne, acid, 86
  alkaline, 87
  bathing, 87
  (Frank), 87
  (Rother), 86
Coloring matters, 349

Colubrina reclinata, analysis, 189
Columba de Brasil (Simaruba), 102
Comandra livida, Hudson's Bay, 101
Combretaceæ, 176
Committee :
    auditing, 525
        report of, 520, 539
    nominating, appointed, 519
        report of, 539
    on arrangements, 2
    on Centennial fund, 3, 555
    on drug market, nominated, 2, 539, 597
        report of, 361
    on exhibition, appointed, 538
    on finance, 3, 555
        reports of, 523, 526
    on legislation, nominated, 2, 540
        report of, 374
    on legislation on proprietary medicines, report of, 394
    on membership, 3, 555
        report of, 529
    on papers and queries, nominated, 2, 539
        report of, 13
    on President's address, appointed, 538
        report of, 575
    on prize essays, nominated, 2, 540
        report of, 538, 539
    on publication, 3, 555
        report of, 537
    on time and place of next annual meeting, appointed, 554
        report of, 573
    on Treasurér's books, appointed, 524,
        reports, 521, 525
    on unofficinal formulas, 2, 575
    to visit National Wholesale Drug Association, 2, 574
Compositæ, 136
Conchairamidine, 305
Conchairamine and salts, 305
Concusconine and salts, 304
Condurango, 133
Condurangin, 133
Confectiones, 63
Conhydrine, isolation of caffeic acid from, 295
Coniferæ, 195
Coniine, isolation of caffeic acid, 295
Conium maculatum, alkaloidal yield from the root, 147
Constitution, 619
    amendment offered, 11, 576
Convallaria majalis, medicinal value, 108
Convolvulaceæ, 129
Copaiba, purity by the microscope, 184
    in pills (borax), 81
    influence on urine, 184
Copaiba-red, 184
Copaifera nitida, Brazil, 102
Copper, 245
    in pharmaceutical preparations, 245
    in alkaline solution and glucose, 246
    detection in wine, 169
Coptis spec. (Lloyd Bros.), 151
Cordial, aniseed, 589
    curaçao, 593
Coriaria ruscifolia, poisonous, 185
Coriariaceæ, 185
Corks, impervious, 58
    bricks from, 195
Corn silk, analysis, 105
Cornus sericea, Hudson's Bay, 101
Cornutine (Kobert and Tanret), 103
Coronilla scorpioides, alkaloid, 183
Cotton, absorbent, 99
    seed contains betaine, 333
Cough weed (Gnaphalium), 136
Council, By-laws of, 628
    expenses of members to be paid, 521
    meetings of urgent necessity only to be held, 581
    minutes, 520, 539, 555, 573, 581
Councils :
    minutes, 520, 539, 555, 573, 581
Country tea (Ledum), 101
Covell, Thos. J., deceased, 532
Crassulaceæ, 175
Crawford, Wm. H., deceased, 532
Cream of tartar, drug market, 365
Creasote, test for carbolic acid, 276
Crescentia cujete, Brazil, 102
        analysis of fruit, 121
Crocetin, 110
Crocin, 110
Crocose, 110
Crocus Alicante, adulterated, 506, 507
    Gatinais, constituents, 109
        quality, 507
    Valencia, purity and price, 505, 507
Croton erythræma, Brazil, 102
    morifolius, oil of, 192
Crua do baboclo (Sicana), Brazil, 101
Cubebs, drug market, 365
    false, description, 187, 188
Cujete (Crescentia), Brazil, 102
Cummings, H. T., pharmaceutical notes, 407
Cuprea bark contains homoquinine, 306
Cupreine, distinction from homoquinine, 309
Cupuliferæ, 195
Curaçao cordial (elixir), 593
    spirit, 608
Curare, strong, 132
Curarine, 132
Cuscuta racemosa, Brazil, 101
Cusparine, properties, 165
Cyanogen, 238
Cyneol, properties, 261
    identity with cajeputol, 253

D.

Dai-phong-tu (Hydnocarpus), 174
Dandelion and chicory (Feil), 496
Daphnetin, constitution, 345
    yield from mezereon, 345
Daturine, identity with atropine, 318
Decocta, 74
    from fluid extracts, 423
Decoctum cinchonæ, of little value, 74
    lemon, in ague, 75
    valerian, as local sedative, 74
Delondre, Aug A., deceased, 530
Delphinium denudatum, 83
Diapocinchonine, 311
Dibromopilocarpine, 320
Dicinchonine and salts, 310, 311
Diehl, C. L., Report on the Progress of Pharmacy, 25
Digitalis, glucosides, 340
Digitalein, estimation, 340
Digitalin, estimation, 340
Digitin, estimation, 340
Dimethyloxychinizine, 337
Dinitrocinchonamine, 304
Dioscoreaceæ, 100
Diphenylamine as test for nitric acid, 216
Dishes, evaporating, cover for, 48
Disinfectant, bromine, 225
        euchlorine, 221
Distillation, microchemical apparatus (Hart), 49
        fractional, apparatus (Hart, Weigert), 49, 50
Dohme, Louis, liquor ferri nitratis, 475
Dorg (Sarcocephalus), 145
Doundake bark (Sarcocephalus) constituents, 145
Dreher, Ernest, deceased, 536
"Drop" method of analysis (Hager), 38
Drosera rotundifolia, necessity of animal food, 174
Droceraceæ 174
Drugs, volume of powdered, 409
    Brazilian, 101
    from Hudson's Bay, 100
    exportation of American (Haber), 493
Drug market, report on, 361
    store arrangement, 56
Dryandra cordata, D. vernicea, 284
Dynamite headache, 278
Dyspepton, 359

E.

Eccles, R. G., infected solutions, 429, 572
Ecgonin, 322, 323
Edgeweed (Sericocarpus), 136

Elæococca cordata, E. vernicea, oil of, 283
Elixir adjuvans, 588
ammonii bromidi, 588
valerianatis, 588
anisi, 589
bismuthi, 589
buchu, 589
compositum, 590
caffeinæ, 590
calcii bromidi, 590
hypophosphitis, 590
lactophosphatis, 590
catharticum compositum, 591
cathartic (Neynaber), 65
cinchonæ, 591
et ferri, 591
ferri, bismuthi et strychninæ, 592
et bismuthi, 592
calcii lactophosphatis, 592
compound cathartic, 591
curaçoa, 593
erythroxyli, 593
eucalypti, 593
euonymi, 594
ferri hypophosphitis, 594
ferri phosphatis, cichonidinæ et strychninæ, 594
ferri phosphatis, quininæ et strychninæ, 595
ferri pyrophosphatis, 595
frangulæ, 595
gentianæ, 596
cum tincturæ ferri chloridi, 596
ferratum, 596
glycyrrhizæ, 596
grindeliæ, 596
guaranæ, 597
humuli, 597
hypophosphitum compositum, 597
laxans (Neynaber), 65
lithii bromidi, 597
malti et ferri, 598
of acetate of magnesium (Neynaber), 65
anise, 589
bismuth, 589
blackberry, 600
bromide of calcium, 590
lithium, 597
potassium, 599
sodium, 601
buchu, 589
compound, 590
caffeine, 590
calisaya. (*See* Cinchona)
bark (Bocking), 454
cascara sagrada, 600
cinchona, 591
alkaloids, 600
and iron, 591
bark, 591
ferrated, 591
iron, bismuth and strychnine, 592
iron and bismuth, 592
lactophosphate of calcium, 592
coca, 593
curaçao, 593
damiana, 602
erythroxylon, 593
eucalyptus, 593
euonymus, 594
frangula, 595
gentian, 596
ferrated, 596
with tincture of chloride of iron, 596
glycyrrhiza, 596
grindelia, 596
guarana, 597
hops, 597
humulus, 597
hyposhosphite of calcium, 590
iron, 594
sodium, 601
hypophosphites, compound, 597
jaborandi, 599
lactophosphate of calcium, 590
Elixir of liquorice, 596
malt and iron, 598
pepsin, 598
(Vigier), 64
and bismuth, 598
iron, 599
phosphate of iron, cinchonidine and strychnine, 594
quinine and strychnine, 595
phosphorus, 599
pilocarpus, 596
pyrophosphate of iron, 595
quinine, compound, 600
(Feil), 453
iron and strychnine, 454
rhamnus purshiana, 600
rhubarb and magnesia (Neynaber), 65
rubus, 600
stillingia, compound, 601
taraxacum, compound, 602
turnera, 602
valerianate of ammonium, 588
strychnine, 601
wahoo, 594
pepsini, 598
et bismuthi, 598
ferri, 599
phosphori 599
pilocarpi, 599
potassii bromidi, 599
quininæ compositum, 600
rhamni purshianæ, 600
rubi, 600
simple, 600
simplex, 600
sodii bromidi, 601
hypophosphitis, 601
stillingiæ compositum, 601
strychninæ valerianatis, 601
taraxaci compositum, 602
turneræ, 602
Elixirs, 64, 588
coloring of, 452
Ellison, Jos., Arctic flora, 495
Emulsio olei morrhuæ, 603
fortior, 602
c. calcii et sodii hypophosphitibus, 603
c. calcii et sodii phosphatibus, 603
lactophosphate, 604
phosphate, 604
hypophosphite, 604
pruno virginiana, 605
ricini, 605
terebinthinæ, 605
Emulsion of castor oil, 605
cod-liver oil, 603
stronger, 602
with hypophosphite, 604
with hypophosphite of calcium and sodium, 603
with lactophosphate of calcium, 604
with phosphate of calcium, 604
with phosphate of calcium and sodium, 603
with wild cherry, 605
oil of turpentine, 605
Entertainments, 516, 581
Entrance fee, proposition to abolish, 520
add to permanent fund, 11, 576
Eperua falcata, histology and analysis, 184
Ergot, constituents (Kobert), 102
(Tanret), 103
test for age, 103
Ergotin, permanent solution, 69
Ericaceæ, 135
Ericolin in Rhododendron maximum, 136
Erythrina Mulungu, Brazil, 102
Erythroxylaceæ, 170
Ether, impurities, 267
absorbs ozone, 267

Ether, paraffin oil as test for water in, 252
  absolute, preparation, 266
  cantharidinated, 97
  phenyl hydrazin diacetic, 337
  phosphorated, 97
Ethereal salts, 267
Ethylcinchonamine, 304
Ethyl, iodide, by means of paraffin oil, 252
  methyl paracoumarate, 112
Eucalyptol, properties, 262
Eucalyptus citriodora, 177
  globulus, inefficiency in marshy districts, 176
Euchlorine as disinfectant, 221
Eulachon oil, 204.
Eupatorium fœniculaceum, uses in the South, 136
Euphorbiaceæ, 190
Euphorbia anomala, E. insulana, 191
  humistrata, E. hypericifolia, E. maculata, uses, 192
  pilulifera, analysis, 191
    in asthma, 192
Evodia longifolia, in miscarriage, 166
Exhibitions discontinued, 525, 553
Extracta fluida (See Fluid Extracts.)
Extracts, 65
  freed from copper, 246
Extractum buchu fluidum compositum, 605
  calabar beans, 66, 67, 68
  cannabis indicæ, green color, 65, 66
  filicis maris, activity, 69
  hops, by means of gasolin, 70
  malti, analysis, 69
  stillingiæ fluidum compositum, 606
Extraction under pressure, 65
  ethereal, getting rid of water, 57

F.

Fats, examination (Hübl), 279
  iodine number, 280
  saponifying point, 280
Fava contra (Canavalia), Brazil, 101
Feil, Joseph, quinine in elixirs, 453
  dandelion and chicory, 496
Fennel, Adolphus, deceased, 530
Fermentation, alcoholic, influence of salicylic acid, 291
  alcoholic, new, 353
  definition of, 433
Ferric hydroxide, colloidal derivatives, 244
  salts, decolorize indigo, 351
Fertilizers, determination of phosphoric acid, 233
Fever grass (Chrysopsis), use in the South, 136
Filter, hot, 54
  for syrupy liquids, 44
  paper, toughening, 42
    washing, 42
  pump, 43
Finance, general rules on, 524, 632
Fire root (calamus), Hudson's Bay, 101
Flora, arctic (Kennedy), 495
Fluid extract of buchu, compound, 605.
  camellia, 71
  cinchona (Redwood), 72
  coca, hypnotic dose, 72
  coffee, raw and roasted, 71
  convallaria, 73
  corn silk, 73
  ergot (benzin previously), 408
  serpentaria in rhus-poisoning, 185
  stillingia, compound. 606
  tea, 71
  teucrium scordium in piles, 72
  verbena hastata, 72
Fluid extracts, for making liquid preparations (Squibb), 71
  (Wall), 419
  precipitates in (Lloyd), 411
Fly poison, 90
  water, 90
Food, chemical, 610
Forest wool, microscopical characters, 195
Formulary of unofficinal preparations, 524, 558, 574, 583
Formulas, unofficinal, report on, 558
Fouquiera splendens, analysis, 177
Franciscea uniflora, analysis of root, 122
Frey, John, deceased, 531
Fuchsin, acid, detection in wine, 340
Fungi, 102
Fungi, in solutions, 429, 431
Funnel, air-tight, 42

G.

Gadus Carbonarius, G. Morrhua, 204
Galangal, analysis, 111
  pungent principle, 257
Galangin, 111
Galangol, 112
Galipeine, 165
Galium aparine, G. pilosum, use in the South, 146, 147
Gallein in alkalimetry, 339
Gallisin in glucose, 285
  barium, g. potassium, 286
Gambier in Johore, 144
Gardenia suaveolens, Brazil, 102
Gas burner (Halbermann), 46
  furnace for high temperatures, 47
Gauze, antiseptic, 99
Geissospermum Vellosii, Brazil, 102
Gelatin, by different methods, 359
Gelatina glycerini, 73
Gellatly, Wm. A., deceased, 531
Gelsemium sempervirens, use in the South, 132
Georgia bark (Pinckneya), 146
Ginger, Jamaica, production, 111
Gingerol, 257
Ginseng, cultivation in Corea, 148
  drug market, 368
Glass, hardened, new process, 236
Globulin, 359
Glucose contains gallisin, 285
  and alkaline solution of copper, 246
Glucoside, 340
Glue, see Gelatin.
Glycerin, action of arsenious acid, 247
  of commerce (Goebel), 481
    (Patch), 484
    (Warder), 486
  drug market, 365
  frozen, 277
  vapors, 278
  jelly (cosmetic and microscopic), 73
Glycerinum aluminis, 73
Glycerites, 73
  ferrous iodide, 232
Gnaphalium polycephalum, 136
  purpurcum, use in the South, 136
Goebel, Edward, caustic potash of commerce, 472
  glycerin of commerce, 481
Gonolobus Condurango, constituents, 133
Good, J. M., diachylon ointment, 461, 578
Grains of paradise, pungent principle, 257
Graminaceæ, 104
Green color for ointments, etc., 349, 350
Guaiacum resin, examination, 165
Guarana, p. c. of caffeine, 170
  drug market, 365
Guaranchem (Lucuma), Brazil, 102
Gum arabic, drug market, 365
Gundi-mani (Indian weight), 182
Gunj (Indian weight), 182
Gutta shea, 134
Guttiferæ, 168
Gynocardia odorata, histology of seed, 172, 174

H.

Haber, Louis A., export of American drugs, 493
Hamamelidaceæ, 175
Hamamelis virginica, properties, 175
Hassencamp, Ferd., deceased, 533
Hazeen (Symphonia), Madagascar, 168
Headache from dynamite, 278
Heat-units of soluble hydrates, 241
Hedychium spicatum, analysis, 112
Helenin, constitution and uses, 345
Helenium nudiflorum, use in the South, 136
Helianthus tuberosus (H. annuus), function of tannin in, 295
Heller, Ludwig, deceased, 534
Hepatica spec. (Lloyd Bros.), 149
Herniaria glabra, uses, 175
Hexacetylgallisin. 286

Homatropine and mercuric chloride, 317
Homoquinine and salts, 306, 307, 308
synthesis, 310
distinction from cupreine, 309
Hops contain choline, 334
new variety, 194
Hortia arborea, Brazil, 102
Hospital stewards, U. S. A., 374
Hottendorf, Aug. W., deceased, 530
Hudson's Bay territories, medicinal plants, 100
Huile de cade, 265
Hydnocarpus alpina, 174
anthelmintica, H. inebrians, histology of seeds, 173
Hydrargyrum cum creta, examination, 248
presence of oxides of mercury, 248
preparation on the large scale, 250
Hydrastine, salts of, 150
yield from hydrastis, 151
Hydrastis canadensis, 150
yield of hydrastine and berberine, 151
Hydrazine, 337
Hydrocarbons, 251
Hydrogen, generation, 210
peroxide, action on peptonization, 359
sulphuretted (See Acid, hydrosulphuric.)
Hygrine, 322
Hymenodictyon excelsum, alkaloid, 146, 333
Hymenodictionine, constitution, 333
Hyoscine, action of alkalies, 318
Hyoscyamine and mercuric chloride, 317
Hyoscyamus, cultivation, 127
annual and biennial leaves, 123
Hypobromites, solutions preserved, 227

I.

Idunium, 251
Ignatia, microscopical character of seed, 313
Ilex Cassine contains caffeine, 190
Illicium floridanum, histology:
capsule, 160
leaf, 159
root, 155
seed, 161
stem, 157
wood, 157
proximate analysis, 161, 162
religiosum, proximate analysis, 162
Indicators (See Alkalimetry).
Indigo, assay, 350
decolorized by ferric salts, 351
Infected solutions (Eccles), 429, 572
Infusion, digitalis, deposit prevented, 74
cinchona, little value, 74
Infusions from fluid extracts, 423
Ingalls, John, President's annual address, 513
Initiation fee. (See Entrance fee.)
Ink, ribbon, 100
Insect powder, drug market, 366
Invitations, received and extended, 517, 554, 573
Iodates, formation in natural deposits, 232
Iodine, drug market, 365
amount in cod-liver oil and in oysters, 230
in sponges, 199
test in presence of bromine and chlorine, 228
ammonio-chloride of silver as test for, 229
solutions, titration of, 229
Iodoform, cleansing mortars, 271
by electrolysis, 270
pencils, 271
test for purity, 270
detection of picric acid, 294
iodine in the urine after application, 271
uses, 270
Ipomœa sinuata, source of noyau, 129
Iridaceæ, 109
Iris versicolor, constituents, 109
Iron, 244
(See also Ferric.)
action of chloral, 272
ammonio-citrate, p. c. of ferric oxide, 293
dialyzed (See liquor ferri).
iodide, preservation, 232
Iron and quinine citrate, preparation, 293
salts, scaled, 244
Isobutyl nitrite, preparation, 268
Isotropine, constitution, 323

J.

Jaborandi de Rio (Artanthe), Brazil, 102
Jaca (Thevetia), Brazil, 102
Jadali (Sarcocephalus), West Africa, 145
Jadavari khatai (Delphinium), East India, 83
Jalap, drug market, 368
Jalapin, constitution, 347
Jalapinol, constitution, 347
Jeffersonia diphylla, contains no berberine, 164
Juglan daceæ, 185
Juglans regia, bark as vesicant, 185
Juniperus communis, Hudson's Bay, 101
oxycedrus, J. phœnicea, J. thurifera, sources of oil of cade, 264
Jurumbeba (Solanum), Brazil, 101

K.

Kämpferid, 111
Kaf(p)ur-kachri (Hedychium), East India, 112
Kairin, detected in urine, 335
Kalmia angustifolia, Hudson's Bay, 101
Kamala, amount of ash, 192
Kansas, pharmacy law, 374, 378
prohibitory law, 381
Kara kalilen (Terminalia), Turkey, 176
Karkar-pukua (Ledum), Hudson's Bay, 101
Kennedy, Geo. W., arctic vegetation, 495
two rhamnus barks, 497
Keratin, 360
Kline, M. N., address on behalf of delegation from National Wholesale Druggists' Association, 517
report on drug market, 361
Kola nut, constituents, 167

L.

Label, porcelain-like, 58
Labiatæ, 129
Lakmoid in alkalimetry, 351
Landerer, F. X., deceased, 536
Langsdorffia hypogæa, Brazil, 101
Lappa officinalis, analysis of fruit, 137
Lappine, 137
Laranjas de mato (Gardenia), Brazil, 102
Lard, purified, 281
Laudanum, Sydenham's improved, 97
Lauraceæ, 113
Laurus Persea, contains perseite, 113
Law, Penal, Minnesota (labels, prescriptions, poisons, etc.), 392
Pharmacy, Kansas, 378
Maine, 382
Massachusetts, 384
Michigan, 385
Minnesota, 393
Prohibitory, Kansas, 381
Proprietary medicines, proposed, 396
Lead, detection in wine, 169
Ledum latifolium, Hudson's Bay, 101
Legislation, report on, 374
Leguminosæ, 179
Lemon, decoction in ague, 75
Leonotis intermedia, L. leonurus, uses, 129
Life members, non-paying old style, Proceedings for, 525, 529
Ligustrum lucidum, source of insect wax, 201
Liliaceæ, 106
Lime, influence on quinine, 300
Linaceæ, 167
Liniment, ammonia, 75
Linseed meal, properties, 167
Liquidambar Altingia, 135
Liquores, 75
Liquor bismuthi et pepsini, 79
calcii saccharati, 79
Doveri, 80
ferri acetatis, 76
chloridi (England), 77
(Rother), 75
dialysatus, 78
hypophosphitis, 606
nitratis (Dohme), 475
oxychlorati, 78

Liquor ipecacuanhæ et morphinæ, 80
magnesii acetatis, 79
plumbi subacetatis as test for fixed oils, 79
Lloyd, J. U., precipitates in fluid extracts, 411, 570
Lodicea Seychellarum, 83
Loganiaceæ, 130
Loganin in nux vomica, 131
Lonchocarpus Peckoltii, Brazil, 102
Lucuma glycyphlaeum, Brazil, 102
Luffa operculata, Brazil, 102
Lukrabo, source of, 173, 174
Lycaconitine, 153
Lycoctonine, action on the heart, 315
source, 153

M

Magnesia mixture for determination of phosphoric acid, 235
Magnesium, 242
acetate, 288
carbonate, examined, 242
citrate, granular, 83
Magnoliaceæ, 155
Maine, pharmacy law, 375, 382
Maisch, John M., purity of commercial Spanish saffron, 504
Malt, analysis, 104
Manaca (Franciscea), alkaloid, 122
Manacine, 122
Mandragora officinalis, alkaloid, 128
Mandragorine, 128
Manganese, occurrence in plants, 243
Mangifera indica, Brazil, 101
Mangueira, Brazil, 101
Mannit of alligator pear, 114
Mannitol in pine-apples, 288
Massa (East Indian weight), 182
Massachusetts, pharmacy law, 376, 384
Materia medica, 100, 493
Matico camphor, 260
Meat, powdered, preparation, 84
Meat juice, 70
Melâo de caboclo (Sicana), 101
Members:
alphabetical list, 656
deceased, 524, 681
election of, 22, 539, 555, 573, 581
honorary, 633
resignation of, 681
roll of, 633
Membership, form of application, 631
Menispermaceæ, 163
Menispermine, 163, 164
Menispermum canadense, alkaloids, 163
Menispine, 163, 164
Menthol, characters, 260
cones of commerce (Bedford), 470
detection of thymol, 261
imported (Bedford), 504
in burns, 261
preparation of, 579
Mercurial preparations, determinat. of oxides, 248
on a large scale, 250
Mercuric chloride as antiseptic, 444, 445
iodide, solubility in water and alcohol, 250
Mercury, 248
in sulphuric acid, 219
oleate, neutral, 280
(Painter), 465, 576
vegetable (Franciscea), 122
Metal, new. 251
Methol-ethyl-tetra-hydropyridine, 323
Methyl, chloride in neuralgia, 273
iodide, by means of paraffin oil, 252
cinchonamine, 304
oxychinizin, 337
Methylene chloride, unsatisfactory character of commercial, 273, 274
Metoos (Populus), Hudson's Bay, 101
Mezereon, yield of daphnetin, 345
Michigan, pharmacy law, 376, 485
Milawapamule (Cornus), Hudson's Bay, 101
Minaret flower (Leonotis), use in South Africa, 129
Minnesota, pharmacy law, 377, 388
penal code, 377, 392
Minutes of the Council, 520, 539, 555, 573, 581
Minutes of the first session, 512
second session, 538
third session, 554
fourth session, 573
Mixture, boro-benzoate of sodium, 80
piles, 80
Mixtures, 80
Monimiaceæ, 194
Morinda citrifolia, M. doundake, M. longiflora, 145
Morphine, estimation in opium, 298
bromine, water as test for, 301
solutions preserved, 299
cocaine antagonistic to, 330
hydrochlorate, formation of apomorphine, 299
fungi of solution, 436
Mouth-wash, antiseptic, 98
Mucilago acaciæ, preservation of (Watkins), 458
Mucuna capitata, seed as weight (East India), 182
Mulungu (Erythrin) Brazil, 102
Munjandi (East India weight), 182
Muntatic (East India weight), 182
Mushrooms, poisonous, silver test, fallacious, 103
Musk, true, export, 206
Muth, John P., deceased, 535
Mylitta australis, description, 103
Myoctonine, 153
physiological action, 316
Myristicaceæ, 115
Myrobalans, 176
Myroxylon Pereiræ, oil of, 180
peruiferum, balsam, 179
Myrtaceæ, 176

N.

Napelline, action on the heart, 315
Naphthaline, medicinal uses, 252
Naphthylamine, as a test for nitrous acid, 215
Narcotine, separation and purification, 299
Nepatihe (Alnus) Hudson's Bay, 101
Neutral principles, 340
New York and Brooklyn Formulary of unofficinal preparations, 583
Nickel, assay in coins. 244
plated ware, removal of rust, 58
Nicotine, estimation in tobacco, 334
Night-sweats of phthisis, picrotoxin in, 344
Nitrates, detected by cinchonamine, 216
Nitrogen, determination, 212
Nitroglycerin, headache from, 278
Nitrous oxide, care in its preparation, 213
Noyau, source of, 130
Nutmeg, is poisonous, 115
Nux vomica, analysis of pulp and seed, 131
microscopical character, 313

O.

Oberdeener, Moses, deceased, 534
Ocotilla (Fouquiera), analysis, 177
Officers, elected, 540
nominated, 539
Oil (oleum) bergamot, anhydrous, 256
drug market, 366
cade, production, 263
camphor (Borneo, Japanese, laurel), 259
castor, drug market, 366
Chinese cabbage, 282
cinæ, constituent, 261
coalfish, 204
cod-liver, drug market, 366
amount of iodine, 230
test of purity, 203
Japanese, 204
Croton morifolius, 192
Elæococca cordata, 283
eulachon, 204
gaultheria in rheumatism, 263
lavender. yield in Grasse, 254
anhydrous, 256
lemon, drug market, 366
anhydrous, 256
limes, hand-pressed *vs.* distilled, 258
neroli, yield in Grasse, 254
olive, subacetate of lead as test, 282
orange, drug market, 366
anhydrous, 256
origanum, anhydrous, 256

Oil (oleum) paraffin for making hydrobromic and hydriodic acids, 226, 227, 252
  solvent power, 252
  iodinized, 98
  as test for water in ether, 252
 peppermint, anhydrous, 256
  chemistry of (Trimble), 501
  drug market, 366
  rectification of, 579
 rose, test for purity, 262
  German, 262
 rose-geranium, anhydrous, 256
 rosemary, yield in Grasse, 254
 rusci, examination, 266.
 saffron, 109
 sesamum for ammonia liniment, 75
 spearmint, chemistry of (Trimble), 501
 tea, 283
 thyme, physiological action, 262
  yield in Grasse, 254
 turtle, 203
 wood, 283
 wormseed (German) constituents, 261
Oils, fixed, examination (Hübl), 279
  iodine number, 280
  saponifying point, 280
 volatile, 251
  anhydrous, 255
  "ecuelled," 258
  estimating minute quantities, 253
  manufacture at Grasse, 253
Ointment, salicylic acid, 62
 diachylon (Good), 461, 578
  (Patch), 463, 578
 mercurial, presence of oxides, 249
  examination, 249
  on a larger scale, 250
  substitute for, 62
 nitrate of lead, 62
Ointments, benzoinated, 61
 (See Cerates)
Oleo vermelho (from myroxylon), 179
Oleum (See Oil).
Oourd (East India weight), 182
Opionin, 348
Opium, assay, discussion on, 566
 cultivation, 171
 drug market, 366
 powdering (benzin previously), 409
 yield, differs according to color of seed, 171
 in France, 171
 in Persia, cause of decline, 171
Opodeldoc, medicated, 75
Orantin in annatto, 174
Organic bases, 297
 chemistry, 251
Orobanchaceæ, 121
Orris root camphor, yield in Grasse, 255
Osmium, 251
Oulachan, 204
Oxalis violacea, Brazil, 102
Oxyacanthine, properties, 163, 164
Oxygen, from the air, 208
 in large quantities, 207
 solidifying point, 206, 207
Oxytropine, 318
Oysters, amount of iodine, 230
Ozone, apparatus (Krebs), 209

P.

Pai-la-chu (wax tree), China, 202
Painter, Emlen, oleate of mercury, 465, 576
Patillo (Croton), Mexico, 192
Pao-kê-tsao (flea tree), China, 201
Pâo-pereira (Geissospermum), Brazil, 102
Papagaio (Mahonia), Brazil, 102
Papaïn, account, 357
Papaveraceæ, 171
Papaverine, separation and purification, 299
Papayotin, account, 357
Paper, mustard, 62
Papers referred for publication, 580
Para-amido-benzol-azodimethyl-aniline, test for nitric acid, 214
  test for nitrous acid, 340
Parabuxidine, 193
Paradol, 257
Paraffin, examination, 200
  unsuited for pomades, 255
Paraldehyd, as test for caramel, 287
Paratudo (Hortia), Brazil, 102
Parsons, Henry B., deceased, 535
Parthenine, 138
Parthenium hysterophorus, uses, 138
Paste, Canquoin's, 98
 tooth, 98
Patch, E. L., steam boiler, 399
  assaying tincture of opium, 448, 566
  diachylon ointment, 463, 578
  calomel of commerce, 476
  glycerin of commerce, 484
  potash, caustic, of commerce, 474
  pills of potassium permanganate, 459, 564
   nitrate of silver, 460, 565
Paullinia sorbilis, 170
Pelletierine, 177
Pellitory, medicinal uses, 137
Pencils, iodoform, 271
Pepsin, assay (Coombs), 353
  (Schlickum), 357
  (Stutzer), 356
 in liquid form, 64
 and bismuth in solution, 79
Peptonization, with plant sap, 358
  effect of peroxide of hydrogen, 359
Percolation, 39
  a study (Rosenwasser), 399
  continuous, with boiling liquids, (Thresh), 41
   (Watson Will), 40
Percolator, proper shape (Remington), 39
   (Rosenwasser), 400, 401
Perfumes, manufacture at Grasse, 253
Periodical publication proposed, 525
Peroba (Aspidospermum), 102
Perseite in fruit of alligator pear, 114
Petsai (Brassica), China, 282
Pharmaceutical notes (Cummings), 407
  preparations, manufacture, discussion, 542, 555
Pharmacy laws (See report on legislation and the respective states).
Phaseolus diversifolius, uses in the South, 183
  limatus, poisonous, 183
  multiflorus, function of tannin, 295
  radiatus, seeds as weights (East India), 182
Phenol, estimation in commercial carbolic acid, 274
 in Pinus sylvestris, 195
 camphor, medicinal value, 276
Phenolphthaleïn, in alkalimetry, 338
  adulteration of, 338
Phenylhydrazin, 337
Phillips, Walter F., deceased, 531
Phlox caroliniana, analysis, 130
Phosphoric anhydride, modifications of, 233
Phosphorus, 233
Physostigma cylindrospermum, 68
Phytolacca decandra, analysis, 119
Phytolaccaceæ, 119
Phytolaccine, 120
Picrocrocin, 110
Picrotin, 343
Picrotoxin, constitution, 343
  in night-sweats, 344
Picrotoxinin, 343
Pills, (Ince,) 81
 keratin-coated, 360
 Blaud's (borax), 81
  (compressed), 82
 copaiva (borax), 81
 hydrargyri, examination, 249
  presence of oxide, 249
  on a large scale, 250
 nitrate of silver (Patch), 460, 565
 potassii permanganate, 82
  (Patch), 459, 564
Pilocarpine, action of bromine, 320
Pinckneya pubens, contains only a glucoside, 146
Pinckneyin, 146

Pineapples contain mannitol, 288
Pine wool, microscopical characters, 195
Pines, distribution in the South, 195
Pinus australis, P. Cubensis, P. glabra, P. inops, P. mitis, P. serotina, P. taeda, 195
    sylvestris, contains phenol, 195
        source of pine wool, 198
Piper angustifolium, camphor of, 260
    anisatum, P. crassipes, P. sylvestre, 187
Piperaceæ, 187
Pipmenthol, characters, 260
Piptadenia gida, Brazil, 102
Plantaginaceæ, 120
Plantago arenaria, P. cynops, P. lanceolata, 121
    major, source of bartung, 121
    psyllium, use of mucilage, 121
Plants, pungent principles, 257
    function of tannin, 295
Plaster Paris, hardening, 241
    diachylon, 464
Plumbaginaceæ, 121
Pois d'Achery, Mauritius, 183
Polemoniaceæ, 130
Polish, turpentine, 100
Polygonaceæ, 115
Polygonum hydropiper, analysis, 115
Pomades, French, in Grasse, 255
Pomegranate bark, constituents, 177
Potash, caustic, of commerce (Goebel), 472
        (Patch), 474
Potassio-stannous chloride, as test for sodium salts, 240
Potassium bitartrate, drugmarket, 365
    iodide, drugmarket, 366
        and sulphate of quinine, 302
        preparation by means of zinc, 231
    permanganate, pills of (Patch), 459, 564
        and sunlight, 243
    sulphocyanate, fungi of solution, 443
Poultice, sponge, 61
Powders, adhesion to shop-bottles, 82
    cholera (East India vegetable), 83
    Seidlitz, prevention of "scum," 83
Pow-e-men-artic (calamus), Hudson's Bay, 101
Precipitation, proper method, 45
Precipitates, hastening of deposition, 45
    in fluid extracts, 411, 570
Preparations, unofficinal, formulary for, 583
Propepton, 359
Proprietary medicines, report on, 394, 549
Propyl, nitrite, 268
Protein, 359
Protium heptaphyllum, Brazil, 102
Prunella vulgaris, Hudson's Bay, 101
Pseudaconine, 153
Pseudaconitine, constitution, 314
Pseudotropine, characters, 318
Pterocaulon pycnostachyum, use in the South, 136
Publications received, 615
Punicine, 177
Pyridine, in asthma, 336
Pyrites, for manufacturing sulphuric acid, 219
Pyrogallol, phthaleïn in alkalimetry, 339

Q.

Quassia, constituents, 341
Quassin, constitution, 341
Quasside, constitution, 342
Quinine, bromine as test, 301
    anhydrous, preparation, 301
    in elixirs (Feil), 453
    fluoride, medicinal uses, 302
    hydrochlorate, 454
    sulphate, drug market, 368, 370
        examination, 301
        influence of lime, 300
        and iodide of potassium, 302
    tannate, preparation, 303

R.

Raas, Francis, deceased, 530
Ranunculaceæ, 148
Ranunculus spec. (Lloyd Bros.), 150
Rasamalus, origin, 135
Rat poison, 100
Red drops, 80
Remijia ferruginea, Brazil, 102
    pedunculata, microscopical character, 142
    Purdieana, microscopical character, 142
        alkaloids, 303, 306
Report of Committees—
    auditing, 520, 539
    on drug market, 361, 541
    on entertainment, 517, 581
    on finance (annual), 526
        (special), 523
    on legislation, 374
    on membership, 529
    on nomination, 539, 577
    on papers and queries, 13
    on President's address, 575
    on prize essays, 538, 539
    on proprietary medicines, 394, 549
    on publication, 537
    on time and place of next annual meeting, 573
    on treasurer's books (1884), 521
        (1885), 525
    on unofficinal formulas, 558, 574, 583
    to visit National Wholesale Druggists' Association, 549
Report—
    of Treasurer, 544
    on credentials, 516, 538
    on investments, 525
    on meetings of State Pharm. Associations, 26
    on the progress of pharmacy, 25
Reports, special, 399
Resolutions of thanks, 580
Resorcin, antidote to, 277
    importance of purity, 277
Retti (East Indian weight), 182
Rhamnaceæ, 188
Rhamnus catharticus, laxative action (Kennedy), 497
Rhamnus Purshiana, constituents, 188
        laxative action (Kennedy), 497
Rheum emodi, 117
    officinale, 116, 117
        analysis, 119
    palmatum, 116, 118
    rhaponticum, 117. 118
        analysis, 119
    undulatum, 117
    Webbianum, 117
Rhigolene and compounds, 251
Rhododendron, maximum, analysis of leaves, 135
Rhubarb, non-existence of chrysophanic acid, 119
    cultivation in Ku-ku-nor mountains, 116
    classification, 117
    Asiatic, 117
    Austrian, 117
    Bucharian, 117
    Chinese, commercial varieties, 116
    East Indian, 117
        analysis, 119
    English, 117
    European, 117
    French, 117
    Himalayan, 117
    Moravian, 117
    Russian, 117
        analysis, 119
    Siberian, 117
    Turkey, 117
Rhus coriarai, 185
    toxicodendron, antidote for, 185
Ricinus sanguineus, function of tannin, 295
Rosaceæ, 179
Rosa de caboclo (Langsdorffia), Brazil, 101
Rosenwasser, N., Percolation, 399
Rubiaceæ, 138
Rubus villosus, leaves as tea, 179
Rutaceæ, 164

S.

Saccharomyces cerevisiæ, S. Pastorianus, 353
Saccharose, synthesis, 284
Saffron, analysis, 109
    purity of Spanish (Maisch), 504
    bitter, 110
    oil, 109

Saffron, sugar, 110
Salary of officers, discussion on, 551
  vote on reporter's, 521
    treasurer's, 551, 557
  of Council, 528, 529
Saligenin, 340
Salts, decomposition of, by filtering paper, 570
Sandalwood bark, Mexican, constituents, 180
Sangue de draco (Croton). Brazil, 102
Sanicula marilandica, analysis of root, 147
Santonica, oil, constituents, 261
Sapindaceæ, 170
Saponimentum, 75
Sapotaceæ, 133
Saprolegnia, 430
Sarcinula ventriculi, 430
Sarcocephalus esculentus, source of doundake bark, 145
Sarraceniaceæ, 112
Sarracenia flava, S. variolaris, use in the South, 112, 113
Sayre, L. E., Fungoid growth in dilute phophoric acid, 446
Scala, Wm. F., deceased, 533
Schimsch, 184
Scopoletine, properties, 128
Scopolia japonica, alkaloids, 128
  luridus, mydriatic properties, 128
Scopoline, 128
Scrophulariaceæ, 122
Sebipira guacu (Bowdichia), Brazil, 183
Sedum acre in diphtheria, 175
Semen cismæ, 184
Separator for extraction of alkaloids, 325, 326
Sericocarpus tortifolius, use in South, 136
Serpentaria, drugmarket. 368
Service tree (Pyrus), 101
Shea butter tree (Butyrospermum), 134
Sheddon, John W., deceased, 534
Sheppard, S. A. D., address to delegation from National Wholesale Druggists' Association, 518
Shikimen, 162
Shikimi (Illicium religiosum), 162
Shikimipikrin, 162
Shikimol, 162
Shoeblacking, 100
Sicana odorifera, Brazil, 101
Silicates, fusing agent for, 236
Silicon, 236
Silver, 250
  ammonio-chloride as test for iodine, 229
  nitrate in pills (Patch), 460
  plating, 250
Simaruba salubris, Brazil, 102
Siphon, 45
Sizygium Jambolanum in diabetes, 177
Soaps of pharmacy, 84
Soap, mercurial, 62
  sulphur, 84
Sodium, 239
  potassio-stannous chloride a test for, 240
  benzoate, determination of source, 289
  bicarbonate, loss of carbonic acid prevented, 241
    as fusing agent for silicates, 236
  boro-benzoate, 80, 290
  koussinate, preparation, 294
  salicylate, absorption of carbonic acid, 291
    as antiseptic, 444
    solution preserved, 292
  sulphide, preparation, 217
Soja hispida, constituents, 184
Solanaceæ, 123
Solanum insidiorum, Brazil, 101
Solidaga odora, uses in the South, 136
Solution of hypophosphite of iron, 606
Solutions (See Liquors).
Solutions, infected (Eccles), 429
Southern Peruvian (Calycanthus), 177
Specific gravity, handy method, 410
  of powders, 34
  of porous bodies, 33
  burette, 35
Spigelia, analysis, 130
Spiritus, 85
Spirit, aromatic, 607
Spirit, of cardamom, compound, 608
  Curaçao, 608
  nitrous ether, estimation of ethyl nitrite, 268
    old specimen, 85
  orange, compound, 607
  phosphorus, 608
Spiritus ammoniæ, aromaticus, 1870 *vs.* 1880, 85
  aromaticus, 607
  aurantii compositus, 607
  cardamomi compositus, 608
  curassao, 608
  odoratus (see Cologne).
  phosphori, 608
Sponge, analysis, 198
  bleached by bromine, 199
  amount of iodine, 199
Squill as rat poison, 100
Standardizing preparations, 56
Starches, typical forms, 284
Statice brasiliensis, analysis of root, 121
Steam boiler (Patch), 399
  kettle (Muerle), 47
Sterculia acuminata, constituents, 167
Sterculiaceæ, 167
Still, with constant level, 55
  pharmaceutical (Wolff), 52
  steam-oven, 55
Strychnine, constitution, 313
  microscopically in the seed, 313
  amyl nitrite as antidote, 272
  bromo- and chloro-compounds, 313
  sulphate, fungi in solution, 438
Strychnos toxifera, constituents, 132
Stryphnodendron polyphyllum, Brazil, 102
Stylophorum diphyllum, adulterant of hydrastis, 151
Styraceæ, 134
Succus taraxaci, commercial, 87
Sucupira (Bowdichia), 183
Sugar, formation in beet-root, 286
  estimation in wine, 287
  refined by acetic acid, 287
  synthetically, 284
Sulphur, apparatus for combustion, 217
Sumach, cultivation in Italy, 185
Suppositories, 88
  cannellated, 88
  cocaine, 330
  gelatin, hollow, 88
  quinine, medicinal value, 88
Sydenham's laudanum, improved, 97
Symphonia fasciculata, 168
Syntonin, 359
Syrupi, 88
Syrup, apricot, 89
  coffee, 609
  corn silk, 90, 91
  dentition, Delabarre, 93, 94
  fruit, preparation, 88
    preserved by benzoic acid, 445
  hypophosphite of calcium, 609
  hypophosphite of calcium and sodium, 609
  hypophosphite of sodium, 611
  hypophosphites, compound, 609
  hypophosphites with iron, 93
  iodide of iron, preserved, 232
  myrrh, 91
  peaches, ferrated, 91
  phosphates compound, 610
  phosphates of iron, quinine, strychnine, 92
  pine apples, 89
  pruni virginianæ (bitter almond), 89
  quassia, 90
  tolu, 1870 *vs.* 1880, 89
    by distillation, 89
    by potassa, 90
  from fluid extract, 423
Syrupus caffeæ, 609
  calcii et sodii hopophosphitum, 609
    hypophosphitis, 609
  calcii lactophosphatis, 91
  hypophosphitum compositus, 609
  phosphatum compositus, 610
  sodii hypophosphitis, 611

T.

Ta-fung-tsze (Hydnocarpus), 173, 174
Tallow, examination, 200
Tamariscineæ, 177
Tamus communis berries, poisonous, 109
Tannin (See Acid, tannic).
Taraxacum juice, 87
and chicory (Feil), 496
Tartar emetic of commerce (Warder), 480
Tea, analysis of commercial sorts, 168
p. c. of caffeine, 331
Telanthera polygonoides, uses in the South, 120
Telegram from British Pharmaceutical Conference, 570
San Francisco, 577
to British Pharmaceutical Conference, 538
Terebinthaceæ, 185
Terminalia chebula, constituents, 176
Ternstrœmiaceæ, 168
Terpin, preparation and uses, 258
Tetrahydro parachinanisol, 337
Thaleichthys pacificus, 204
Thalictrum spec. (Lloyd Bros.), 149
Thallin, preparation, 337, 338
Thaœ-phu-tu (Hydnocarpus), 174
Thevetia neriifolia, Brazil, 102
Thymelaceæ, 113
Thymol, detection in menthol, 261
Timbo (Lonchocarpus', Brazil, 102
Tinctura ferri citro-chloridi, 611
persionis, 611
Tinctures, 94
examination of deposits, 94
from fluid extracts, 420
Tincture of acetate of iron, deposit, 94
benzoin, in nasal catarrh, 95
citrochloride of iron, 611
cudbear, 611
digitalis, deposit, 94
iodine, as blow-pipe reagent, 96
decolorata, 96
iron, tasteless, 611
lobelia, ethereal, deposit, 94
opium, assaying (Bartlet), 446
(Patch), 448
discussion on preparation and assaying, 566
phosphorus, 608
quinine, variable strength, 95
rhubarb and magnesia, 96
sanguinaria, deposit, 94
Tinguaciba (Xanthoxylon), Brazil, 102
Titanium carbonate, so-called, 248
Tobacco, estimation of nicotine, 334
Todd, A. M., remarks on oil of peppermint, 579
Tola (East India weight), 182
Tompkins, Orlando, deceased, 531
Tooth paste, 98
Torula diabetica, 430
Trebizond tea (Vaccinium), 135
Trimble, Henry, Oils of peppermint and spearmint, 501
Trollius laxus, 151
Troth, Samuel F., Letter to Local Secretary, 577
Trypsin, 359
Tufts, Charles A., Treasurer's report, 544
Tung-ching-shu (insect wax), 201
Turtle oil, 203
Tu-tu (Coriaria), 185
Tyson, Samuel E., deceased, 533

U.

Ucisalu-salu (Evodia), 166
Umbelliferæ, 147
Uncaria gambir, 144
Unguentum. (See Ointment.)
Urea, estimation, apparatus, 335
Urine, comparison of tests for albumen, 352
influence of copaiba, 184
Urson, in Rhododendron maximum, 136
Urticaceæ, 193

V.

Vaccinium Arctostaphylos, characters, 135
Valerian, as a local sedative, 75
Valerianaceæ, 138
Valve for flask, 50
Vanilla palmarum, Brazil, 102
Vapor condenser (Wolff), 53
Varnish for paper, wood and metal, 59
Veratroyl-aconine, 314
Verbena hastata, medicinal use, 129
Verbenaceæ, 129
Vessels, laboratory, cleaning, 57
wooden, taste and odor removed, 57
Vicia faba, function of tannin, 295
Vincetoxicum officinale, alkaloid, 133, 344
Vincetoxine, modification of, 344
Vinegar, test for mineral acids, 221
antiseptic, 60
(See Acetum.)
Vinum carnis et ferri, 611
ferri et cinchonæ, 612
iodatum, 98
pepsini, 612
Violet wood, 185
Vitaceæ, 169
Voa-su-vuara (Symphonia), Madagascar, 168
Vongo (Symphonia), 168

W,

Wakinakim (Juniperus), Hudson's Bay, 101
Waldwolle, 195
Wall, A. O., Fluid extracts for making liquid preparations, 419
Walnut bark, as vesicant, 185
Wash bottle, 45, 46
We-suk-a-pup (Kalmia), Hudson's Bay, 101
Warder, R. B., black antimony of commerce, 479
glycerin of commerce, 486
tartar emetic of commerce, 480
Water, bitter almond, 60
camphor, preserves alkaloidal solutions, 61, 316
distilled, contains nitrous acid, 211
orange flower, 254
fungi of, 441
potable, examination, 210
purified (alum), 410
wild cherry leaves, 61
medicated, 60
Water bath, 54
Watkins, Thomas W., preservation of mucilago acaciæ, 458
Wax, carnauba, examination, 200
Chinese, account, 201
insect, account, 201
Japan, examination, 200
ocotilla, 179
yellow, how to bleach, 201
examination, 201
Wayakash (Abies), Hudson's Bay, 101
Weights derived from seed in East India, 181
Wetchus-y-usk-wa (Pyrus), Hudson's Bay, 101
Wheat grains (East India weight), 182
Wild dagga (Leonotis), 129
horehound (Eupatorium), 136
Wilder, Graham, deceased, 534
Wine, estimation of sugar, 287
Grecian, 169
test for mineral acids, 221
test for tartaric acid, 293
test for acid fuchsin, 340
test for copper and lead, 169
Wine of beef and iron, 611
iron and cinchona, 612
pepsin, 355, 612
Wines, medicinal, from fluid extracts, 422
(See Vinum.)
Wood, Alonzo F., deceased, 536
Wood, destructive distillation, 284
Wool, pine, forest, 195

X.

Xanthoxylum Caribæum, analysis, 186
Tinguassiba, Brazil, 102

Y.

Yeast, vitality destroyed by salicylic acid, 291

Z.

Zinc, 245
action on chloral hydrate, 272
rapid elimination of arsenic, 245